Lifespan Development

Lifespan Development

A Topical Approach

NICOLE ARDUINI-VANHOOSE

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Lifespan Development: A Topical Approach

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How to Read this Book

Organization

Chapters are organized predictably with figures, tables, and videos that further organize and explain course concepts. The videos that are directly embedded in the reading are mini-lectures on the concept and are recommended to help you understand complex ideas.

Learning Objectives–Grey Boxes

Before reading, review the learning objectives for the chapter. These objectives help guide your focus.

Exercises–Blue Boxes

Exercises provide you with an opportunity to practice and reflect on the concepts that you are learning.

Examples–Red Boxes

Case studies, interviews, examples, and current events highlight concepts in practice. This content is not a direct explanation of concepts, but exemplify how it applies in the real world.

Try It–Purple Boxes

These are practice questions to assess your understanding of the content. They do not count and can be submitted repeatedly.

Effective Reading

Reading a textbook is not like reading a novel. Opening a book and reading from cover to cover does not typically result in an effective reading of the content. One of the most recommended methods for effective reading is the SQ4R method. SQ4R is an acronym for: Survey, Question, Read, Respond, Record, and Review. The SQ4R method may seem time-consuming at first, but once you know the steps, it only takes a few minutes.

What are the benefits of using SQ4R?

- It's an active learning strategy that can be adapted to suit an individual's study preferences.
- It provides a strategy to retain a lot of factual detail, reducing the amount of information that has to be relearned for exams.
- It prompts the creation of study material to be used when preparing for exams.
- It helps to identify errors or areas of confusion.

Step 1: Survey the Textbook and Chapters

- Read the preface and introduction to the text, and browse through the table of contents and the index. This will describe the main topics and the basic organizational structure of the book.
- Read the introduction and conclusion in each chapter and subsection.
- Scan the titles and subtitles. Study the pictures, charts, or graphs.
- Read the summary and any chapter questions.

Step 2: Start with a Question

- Take the section title, subtitle, or the first sentence of each paragraph and turn it into a question.
- For example: "Functions of the spinal cord" becomes "What are the functions of the spinal cord?"

Step 3: Read Actively

- Read carefully and actively by creating a "dialogue" with the text.
- Try to find the answer to the question you created, and ask questions as you read.
- Be careful not to skim the text looking for the answer, as you might miss other important information.

Step 4: Respond to Your Question

- Close the textbook and answer the question you created in your own words.
- If you can't answer the question, reread the section until you can.
- If, after a few tries, you still can't answer the question, go on to the next few sections and see if things become clearer.
- If that doesn't help, you may need to change your question. Try making it broader or narrower.
- If changing your question doesn't help, get some assistance. Your instructor or TA are good places to start or contact Learning Services.

Step 5: Record Your Notes

- Once you understand the material and can summarize it in your own words make a record of it.
- Common methods are highlighting and/or marking the text or taking notes, or some combination of both.
- Whichever methods you choose, it's critical to read and understand the material first, and then go back and record.

- See below for the pros and cons of notetaking and highlighting.
- See our resources for help with note-taking.

Step 6: Review Your Notes

- Do a thorough review of lecture and text notes weekly, and briefly before each class.
- Make weekly review periods effective by starting from the beginning of the course in each review session. Though the volume of review material increases as the semester progresses, the amount of time needed to review older material decreases. After you've reviewed the first week's material a few times, it will take only minutes to skim over it and recall the key points.

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MAIN BODY

This is the first chapter in the main body of the text. You can change the text, rename the chapter, add new chapters, and add new parts.

LIFESPAN DEVELOPMENT

Learning Objectives

- Describe human development and its three domains: physical, cognitive, and psychosocial development
- Explain key human development issues about the nature of change: continuous/discontinuous, one course/multiple courses, and nature/nurture
- Describe the basic periods of human development
- Describe Baltes' lifespan perspective with its key principles about development
- Explain what is meant by development being lifelong, multidimensional, and multidirectional
- Explain contextual influences on development

Welcome to the study of lifespan development! This is the scientific study of how and why people change or remain the same over time.

Think about how you were five, ten, or even fifteen years ago. In what ways have you changed? In what ways have you remained the same? You have probably changed physically; perhaps you've grown taller and become heavier. But you may have also experienced changes in the way you think and solve problems. Cognitive change is noticeable

when we compare how 6-year olds, 16-year olds, and 46-year olds think and reason, for example. Their thoughts about themselves, others, and the world are probably quite different. Consider friendship—a 6-year-old may think that a friend is someone with whom they can play and have fun. A 16-year old may seek friends who can help them gain status or popularity. And the 46-year old may have acquaintances, but rely more on family members to do things with and confide in. You may have also experienced psychosocial change. This refers to emotions and psychological issues as well as social roles and relationships. Psychologist Erik Erikson suggests that we struggle with issues of trust, independence, and intimacy at various points in our lives (we will explore this thoroughly throughout the course.)

This is a very interesting and meaningful course because it is about each of us and those with whom we live and work. One of the best ways to gain perspective on our own lives is to compare our experiences with those of others. In this course, we will strive to learn about each phase of human development and the physical, cognitive, and psychosocial changes, all the while making cross-cultural and historical comparisons and connections to the world around us.

In addition, we will take a lifespan developmental approach to learning about human development. That means that we won't just learn about one particular age period by itself; we will learn about each age period, recognizing how it is related to both previous developments and later developments. For instance, it helps us to understand what's happening with the 16-year old by knowing about development in the infant, toddler, early childhood, and middle childhood years. In turn, learning about all of that development and development during adolescence and early adulthood will help us to more fully understand the person at age 46 (and so on throughout midlife and later adulthood).

Development does not stop at a certain age; development is a lifelong process. We may find individual and group differences in patterns of development, so examining the influences of gender,

cohort/generation, race, ethnicity, culture, socioeconomic status, education level, and time in history is also important. With the lifespan developmental perspective, we will gain a more comprehensive view of the individual within the context of their own developmental journey and within social, cultural, and historical contexts. In this way, this course covers and crosses multiple disciplines, such as psychology, biology, sociology, anthropology, education, nutrition, economics, and healthcare.

Think It Over

Wherever you are in your own lifespan developmental journey, imagine yourself as an elderly person about to turn 100 years old (becoming a "centenarian"). If researchers want to understand you and your development, would they get the full picture if they just took a snapshot (so to speak) of you at that point in time? What else would you want them to know about you, your development, and your experiences to really understand you?

Human Development

What aspects of ourselves change and develop as we journey through life? We move through significant physical, cognitive, and psychosocial changes throughout our lives—do these changes happen in a systematic way, and to everyone? How much is due to genetics and how much is due to environmental influences and experiences (both within our personal control and beyond)? Is there just one course of development or are there many different courses of development? In this module, we'll examine these questions and learn about the major stages of development and what kind of developmental tasks and transitions we might expect along the way.

Defining Human Development

Human development refers to the physical, cognitive, and psychosocial development of humans throughout the lifespan. What types of development are involved in each of these three domains, or areas, of life? Physical development involves growth and changes in the body and brain, the senses, motor skills, and health and wellness. Cognitive development involves learning, attention, memory, language, thinking, reasoning, and creativity. Psychosocial development involves emotions, personality, and social relationships.

Physical Domain

Many of us are familiar with the height and weight charts that pediatricians consult to estimate if babies, children, and teens are growing within normative ranges of physical development. We may also be aware of changes in children's fine and gross motor skills, as well as their increasing coordination, particularly in terms of playing sports. But we may not realize that physical development also involves brain development, which not only enables childhood motor coordination but also greater coordination between emotions and planning in adulthood, as our brains are not done developing in infancy or childhood. Physical development also includes puberty, sexual health, fertility, menopause, changes in our senses, and primary versus secondary aging. Healthy habits with nutrition and exercise are also important at every age and stage across the lifespan.

Cognitive Domain

If we watch and listen to infants and toddlers, we can't help but wonder how they learn so much so fast, particularly when it comes to language development. Then as we compare young children to those in middle childhood, there appear to be huge differences in their ability to think logically about the concrete world around them. Cognitive development includes mental processes, thinking, learning, and understanding, and it doesn't stop in childhood. Adolescents develop the ability to think logically about the abstract world (and may like to debate matters with adults as they exercise their new cognitive skills!). Moral reasoning develops further, as does practical intelligence—wisdom may develop with experience over time. Memory abilities and different forms of intelligence tend to change with age. Brain development and the brain's ability to change and compensate for losses is significant to cognitive functions across the lifespan, too.

Psychosocial Domain

Development in this domain involves what's going on both psychologically and socially. Early on, the focus is on infants and caregivers, as temperament and attachment are significant. As the social world expands and the child grows psychologically, different types of play, and interactions with other children and teachers become important. Psychosocial development involves emotions, personality, self-esteem, and relationships. Peers become more important for adolescents, who are exploring new roles and forming their own identities. Dating, romance, cohabitation, marriage, having children, and finding work or a career are all parts of the transition into adulthood. Psychosocial development continues across adulthood with similar (and some different) developmental

issues of family, friends, parenting, romance, divorce, remarriage, blended families, caregiving for elders, becoming grandparents and great grandparents, retirement, new careers, coping with losses, and death and dying.

As you may have already noticed, physical, cognitive, and psychosocial development are often interrelated, as with the example of brain development. We will be examining human development in these three domains in detail throughout the modules in this course, as we learn about infancy/toddlerhood, early childhood, middle childhood, adolescence, young adulthood, middle adulthood, and late adulthood development, as well as death and dying.

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Video 1. *Domains in Development* describes the three domains and how those domains interact.

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Who Studies Human Development and Why?

Many academic disciplines contribute to the study of development and this type, of course, is offered in some schools as psychology (particularly as developmental psychology); in other schools, it is taught under sociology, human development, or family studies. This multidisciplinary course is made up of contributions from researchers in the areas of health care, anthropology, nutrition, child development, biology, gerontology, psychology, and sociology, among others. Consequently, the stories provided are rich and well-rounded and the theories and findings can be part of a collaborative effort to understand human lives.

The main goals of those involved in studying human development are to describe and explain changes. Throughout this course, we will describe observations during development, then examine how theories provide explanations for why these changes occur. For example, you may observe two-year-old children to be particularly temperamental, and researchers offer theories to explain why that is. We'll learn a lot more about theories, especially developmental theories, in the next module.

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Key Issues in Human Development

There are many different theoretical approaches regarding human development. As we evaluate them in this course, recall that development focuses on how people change, and the approaches address the nature of change in different ways:

- Are changes an active or passive process?
- Is the change smooth or uneven (continuous versus discontinuous)?
- Is this pattern of change the same for everyone, or are there different patterns of change (one course of development versus many courses)?
- Are there prescribed periods in which change must occur (critical and sensitive periods)?
- How do genetics and environment interact to influence development (nature versus nurture)?

Is Development Active or Passive?

How much does one play a role in their developmental path? Are we at the whim of our genetic inheritance or the environment that surrounds you, or are we able to decide and steer our development? Some theorists believe that humans play a much more active role in their development. Piaget, for instance, believed that children actively explore their world and construct new ways of thinking to explain the things they experience. Humanist theorists forward that people have self-determination. In contrast, many behaviorists view humans as being more passive in the developmental process, with outcomes being determined by their experiences. Evolutionary

psychologists emphasize the role of heredity in determining development. As we explore various theories, ask yourself whether each approach considers development to be an active or passive process.

Is Development Continuous or Discontinuous?

Is human development best characterized as a slow, gradual process, or as one of more abrupt change? The answer to that question often depends on which developmental theorist you ask and which topic is being studied. **Continuous development** theories view development as a cumulative process, gradually improving on existing skills (see figure below). With this type of development, there is a gradual change. Consider, for example, a child's physical growth: adding inches to their height year by year. In contrast, theorists who view development as **discontinuous** believe that development takes place in unique stages and that it occurs at specific times or ages. With this type of development, the change is more sudden, such as an infant's ability to demonstrate awareness of object permanence (which is a cognitive skill that develops toward the end of infancy, according to Piaget's cognitive theory—more on that theory in the next module).

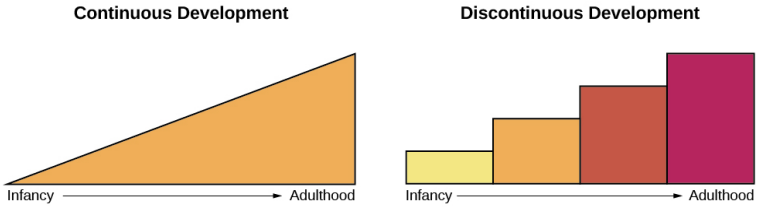
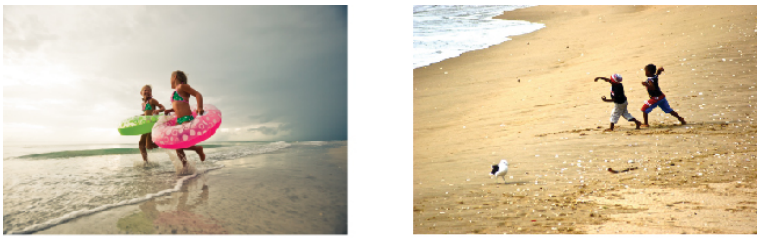


Figure 1*. The concept of continuous development can be visualized as a smooth slope of progression, whereas discontinuous development sees growth in more discrete stages.*

Is There One Course of Development or Many?

Is development essentially the same, or universal, for all children (i.e., there is one course of development) or does development follow a different course for each child, depending on the child's specific genetics and environment (i.e., there are many courses of development)? Do people across the world share more similarities or more differences in their development? How much do culture and genetics influence a child's behavior?Stage theories hold that the sequence of development is universal. For example, in cross-cultural studies of language development, children from around the world reach language milestones in a similar sequence (Gleitman & Newport, 1995). Infants in all cultures coo before they babble. They begin babbling at about the same age and utter their first word around 12 months old. Yet we live in diverse contexts that have a unique effect on each of us. For example, researchers once believed that motor development followed one course for all children regardless of culture. However, childcare practices vary by culture, and different practices have been found to accelerate or inhibit the achievement of developmental milestones such as sitting, crawling, and walking (Karasik, Adolph, Tamis-LeMonda, & Bornstein, 2010).For instance, let's look at the Aché society in Paraguay. They spend a significant amount of time foraging in forests. While foraging, Aché mothers carry their young children, rarely putting them down to protect them from getting hurt in the forest. Consequently, their children walk much later: They walk around 23–25 months old, in comparison to infants in Western cultures who begin to walk around 12 months old. However, as Aché children become older, they are allowed more freedom to move about, and by about age 9, their motor skills surpass those of U.S. children of the same age: Aché children can climb trees up to 25 feet tall and use machetes to chop their way through the forest (Kaplan & Dove, 1987). As you can see, our development is influenced by multiple contexts, so the timing of basic motor functions may vary across cultures. However, the functions are

present in all societies.



(a) (b)

Figure 2. *All children across the world love to play. Whether in (a) Florida or (b) South Africa, children enjoy exploring sand, sunshine, and the sea. (credit a: modification of work by "Visit St. Pete/Clearwater"/Flickr; credit b: modification of work by "stringer_bel"/Flickr)*

Are there Critical or Sensitive Periods of Development?

Various developmental milestones are universal in timing. For example, most children begin learning and expressing language during their first year. However, what happens if a person misses that window of typical experience? What if the child were not exposed to language early in life, could they learn language in later years? Does the timing of experience influence development, and can it be corrected later?

Psychologists believe that there are time spans in which a person is biologically ready for certain developments, but successful progress is reliant on the person having essential experiences during that time. If these experiences fail to occur or occur after the time span ends, then the person will not develop normally or may not fully recover, even with later intervention.

Some aspects of development have critical periods; finite time spans in which specific experiences must occur for successful development. Once this period ends, later experiences would have

no impact on this aspect of development. Failure to have the necessary experiences during the critical period will result in permanent impairments. For instance, a person that does not receive minimal nutrition during childhood would not reach their full height potential by adulthood. Even with excellent nutrition during adulthood, they would never grow taller because their critical period of growth has ended.

More often, developmental aspects are considered to have sensitive periods. Like critical periods, a sensitive period requires particular experiences during a specific time for development to occur. However, with sensitive periods, experiences after the period ends can support developmental gains later in life. It is not to say that post-period interventions will always be simple or successful. For example, someone that was not exposed to language in early childhood, with intervention and great effort, may be able to make some gains in late childhood, but may not fully recover all language-related skills.

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Video 1. *Sensitive vs Critical Periods of Learning* explains the differences between the two

How Do Nature and Nurture Influence Development?

Are we who we are because of genetics, or are we who we are because of our environment? For instance, why do biological children sometimes act like their parents—is it because of genetics or because of early childhood environment and what the child has learned from their parents? What about children who are adopted—are they more like their biological families or more like their adoptive families? And how can siblings from the same family be so different?

This longstanding question is known in psychology as the nature versus nurture debate. For any particular aspect of development, those on the side of **nature** would argue that heredity plays the most important role in bringing about that feature. While those on the side of **nurture** would say that one's environment is most significant in shaping the way we develop. However, most scholars agree that there is a constant interplay between the two forces. It is difficult to isolate the root of any single outcome as a result solely of nature or nurture.

We are all born with specific genetic traits inherited from our parents, such as eye color, height, and certain personality traits. Beyond our basic genotype, however, there is a deep interaction between our genes and our environment. Our unique experiences in our environment influence whether and how particular traits are expressed, and at the same time, our genes influence how we interact with our environment (Diamond, 2009; Lobo, 2008). There is a reciprocal interaction between nature and nurture as they both shape who we become, but the debate continues as to the relative contributions of each.

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Video 2. *Gene-Environment Interaction* explains how nature and nurture interact to influence development.

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The Forbidden Experiment

As previously discussed, psychologists are interested in the role of nature and nurture on human development. It is almost impossible to remove the influence of either nature or nurture to study only the influence of the other. The closest that we have come to this is the study of feral children.

A **feral child** (also called **wild child**) is a human child who has lived isolated from human contact from a very young age, and so has had little or no experience of human care, behavior, or human language. There are several confirmed cases and other speculative ones. Feral children may have experienced severe abuse or trauma before being abandoned or running away. The following three cases are examples of feral children that spent part of their lives isolated from normal human society. Examining these cases helps us better understand the key concept of nature versus nurture. Note some of the differences between these cases and consider why these differences may exist.

Oxana

John

Genie

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Periods of Human Development

Think about the lifespan and make a list of what you would consider the basic periods of development. How many periods or stages are on your list? Perhaps you have three: childhood, adulthood, and old age. Or maybe four: infancy, childhood, adolescence, and adulthood. Developmentalists often break the lifespan into eight stages:

1. Prenatal Development
2. Infancy and Toddlerhood
3. Early Childhood
4. Middle Childhood
5. Adolescence
6. Early Adulthood
7. Middle Adulthood
8. Late Adulthood

In addition, the topic of "Death and Dying" is usually addressed after late adulthood since overall, the likelihood of dying increases in later life (though individual and group variations exist). Death and dying will be the topic of our last module, though it is not necessarily a stage of development that occurs at a particular age.

The list of the periods of development reflects unique aspects of the various stages of childhood and adulthood that will be explored in this book, including physical, cognitive, and psychosocial changes. So while both an 8-month-old and an 8-year-old are considered children, they have very different motor abilities, cognitive skills, and social relationships. Their nutritional needs are different, and their primary psychological concerns are also distinctive. The same is true of an 18-year-old and an 80-year-old,

both considered adults. We will discover the distinctions between being 28 or 48 as well. But first, here is a brief overview of the stages.

Prenatal Development

Figure 1. *An embryo at 8 weeks of development.*

Conception occurs and development begins. There are three stages of prenatal development: germinal, embryonic, and fetal periods. All of the major structures of the body are forming and the health of the mother is of primary concern. There are various approaches to labor, delivery, and childbirth, with potential complications of pregnancy and delivery, as well as risks and complications with newborns, but also advances in tests, technology, and medicine. The influences of nature (e.g., genetics) and nurture (e.g., nutrition and teratogens, which are environmental factors during pregnancy that can lead to birth defects) are evident. Evolutionary psychology, along with studies of

twins and adoptions, help us understand the interplay of factors and the relative influences of nature and nurture on human development.

Infancy and Toddlerhood

Figure 2. *Major development happens during the first two years of life, as evidenced by this newborn baby and his toddler brother.*

The first year and a half to two years of life are ones of dramatic growth and change. A newborn, with many involuntary reflexes and a keen sense of hearing but poor vision, is transformed into a walking, talking toddler within a relatively short period of time. Caregivers similarly transform their roles from those who manage feeding and sleep schedules to constantly moving guides and safety inspectors for mobile, energetic children. Brain development happens at a remarkable rate, as does physical growth and language development. Infants have their own temperaments

and approaches to play. Interactions with primary caregivers (and others) undergo changes influenced by possible separation anxiety and the development of attachment styles. Social and cultural issues center around breastfeeding or formula-feeding, sleeping in cribs or in the bed with parents, toilet training, and whether or not to get vaccinations.

Early Childhood

Figure 3. *Early childhood, or the preschool years, around ages 2-6, is filled with incredible amounts of growth and change.*

Early childhood is also referred to as the preschool years, consisting of the years that follow toddlerhood and precede formal schooling, roughly from around ages 2 to 5 or 6. As a preschooler, the child is busy learning language (with amazing growth in vocabulary), is gaining a sense of self and greater independence, and is beginning to learn the workings of the physical world. This knowledge does

not come quickly, however, and preschoolers may initially have interesting conceptions of size, time, space and distance, such as demonstrating how long something will take by holding out their two index fingers several inches apart. A toddler's fierce determination to do something may give way to a four-year-old's sense of guilt for doing something that brings the disapproval of others.

Middle Childhood

Figure 4. *Middle childhood spans most of what is traditionally primary school, or the ages between 6-11.*

The ages of 6-11 comprise middle childhood and much of what children experience at this age is connected to their involvement in the early grades of school. Now the world becomes one of learning and testing new academic skills and assessing one's abilities and accomplishments by making comparisons between self and

others. Schools participate in this process by comparing students and making these comparisons public through team sports, test scores, and other forms of recognition. The brain reaches its adult size around age seven, but it continues to develop. Growth rates slow down and children are able to refine their motor skills at this point in life. Children also begin to learn about social relationships beyond the family through interaction with friends and fellow students; same-sex friendships are particularly salient during this period.

Adolescence

Figure 5. *Adolescence, or the age roughly between 12–18, is marked by puberty and sexual maturation, accompanied by major socioemotional changes.*

Adolescence is a period of dramatic physical change marked by an overall physical growth spurt and sexual maturation, known as puberty; timing may vary by gender, cohort, and culture. It is also a

time of cognitive change as the adolescent begins to think of new possibilities and to consider abstract concepts such as love, fear, and freedom. Ironically, adolescents have a sense of invincibility that puts them at greater risk of dying from accidents or contracting sexually transmitted infections that can have lifelong consequences. Research on brain development helps us understand teen risk-taking and impulsive behavior. A major developmental task during adolescence involves establishing one's own identity. Teens typically struggle to become more independent from their parents. Peers become more important, as teens strive for a sense of belonging and acceptance; mixed-sex peer groups become more common. New roles and responsibilities are explored, which may involve dating, driving, taking on a part-time job, and planning for future academics.

Early Adulthood

Figure 6. *Early adulthood, roughly ages 20-40, may be split into yet another category of "emerging adulthood," as there are often profound differences between younger adults and those in their late 30s.*

Late teens, twenties, and thirties are often thought of as early adulthood (students who are in their mid to late 30s may love to hear that they are young adults!). It is a time when we are at our physiological peak but are most at risk for involvement in violent crimes and substance abuse. It is a time of focusing on the future and putting a lot of energy into making choices that will help one earn the status of a full adult in the eyes of others. Love and work are the primary concerns at this stage of life. In recent decades, it has been noted (in the U.S. and other developed countries) that young adults are taking longer to "grow up." They are waiting longer to move out of their parents' homes, finish their formal education, take on work/careers, get married, and have children. One psychologist, Jeffrey Arnett, has proposed that there is a new stage of development after adolescence and before early adulthood, called "emerging adulthood," from 18 to 25 (or even 29) when individuals are still exploring their identities and don't quite feel like adults yet. Cohort, culture, time in history, the economy, and socioeconomic status may be key factors in when youth take on adult roles.

Middle Adulthood

Figure 7. *Middle adulthood spans the years between ages 40-65.*

The late thirties (or age 40) through the mid-60s are referred to as middle adulthood. This is a period in which physiological aging that began earlier becomes more noticeable and a period at which many people are at their peak of productivity in love and work. It may be a period of gaining expertise in certain fields and being able to understand problems and find solutions with greater efficiency than before. It can also be a time of becoming more realistic about possibilities in life; of recognizing the difference between what is possible and what is likely. Referred to as the sandwich generation, middle-aged adults may be in the middle of taking care of their children and also taking care of their aging parents. While caring about others and the future, middle-aged adults may also be questioning their own mortality, goals, and commitments, though not necessarily experiencing a "mid-life crisis."

Watch It: The UP Series

Video 1. In 1964, researchers and filmmakers began a fascinating and landmark documentary series known as the UP Series. The UK-based Granada's World in Action team, inspired by the Jesuit maxim, "Give me the child until he is seven and I will give you the man," interviewed a diverse group of seven-year-old children from all over England. In the first film, called "Seven Up!," they asked seven-year-old children about their lives, dreams, and fears for the future. Michael Apted, a researcher for the original film, has returned to interview these individuals every seven years since then, at ages 14, 21, 28, 35, 42, 49, 56 and now at age 63.

This video gives a nice overview of the series (through the lens of a film analysis of what makes it so successful and engaging). You can watch the Up Series on YouTube.

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Late Adulthood

Figure 8. *Late adulthood is generally viewed as age 65 and older, but there are incredible variations in health and lifestyle between the "young old" and the "oldest old," who may be well into their 100s.*

This period of the lifespan, late adulthood, has increased in the last 100 years, particularly in industrialized countries, as average life expectancy has increased. Late adulthood covers a wide age range with a lot of variation, so it is helpful to divide it into categories such as the "young old" (65-74 years old), "old old" (75-84 years old), and "oldest old" (85+ years old). The young old are similar to middle-aged adults; possibly still working, married, relatively healthy, and active. The old old have some health problems and challenges with daily living activities; the oldest old are often frail and in need of long term care. However, many factors are involved and a better way to appreciate the diversity of older adults is to go beyond chronological age and examine whether a person is experiencing optimal aging (like the gentleman pictured in Figure 8 who is in very good health for his age and continues to have

an active, stimulating life), normal aging (in which the changes are similar to most of those of the same age), or impaired aging (referring to someone who has more physical challenge and disease than others of the same age).

Death and Dying

Figure 9. *How people think about death, approach death, and cope with death vary depending on many factors. Photo Courtesy Robert Paul Young*

The study of death and dying is seldom given the amount of coverage it deserves. Of course, there is a certain discomfort in thinking about death, but there is also a certain confidence and acceptance that can come from studying death and dying. Factors

such as age, religion, and culture play important roles in attitudes and approaches to death and dying. There are different types of death: physiological, psychological, and social. The most common causes of death vary with age, gender, race, culture, and time in history. Dying and grieving are processes and may share certain stages of reactions to loss. There are interesting examples of cultural variations in death rituals, mourning, and grief. The concept of a "good death" is described as including personal choices and the involvement of loved ones throughout the process. Palliative care is an approach to maintain dying individuals' comfort level, and hospice is a movement and practice that involves professional and volunteer care and loved ones. Controversy surrounds euthanasia (helping a person fulfill their wish to die)—active and passive types, as well as physician-assisted suicide, and legality varies within the United States.

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Think It Over

Think about your own development. Which period or stage of development are you in right now? Are you dealing with similar issues and experiencing comparable physical, cognitive, and psychosocial development as described

above? If not, why not? Are important aspects of development missing and if so, are they common for most of your cohort or unique to you?

The Lifespan Perspective

As we have learned, human development refers to the physical, cognitive, and psychosocial changes and constancies in humans over time. There are various theories pertaining to each domain of development, and often theorists and researchers focus their attention on specific periods of development (with most traditionally focusing on infancy and childhood; some on adolescence). But isn't it possible that development during one period affects development in other periods and that humans can grow and change across adulthood too? In this section, we'll learn about development through the lifespan perspective, which emphasizes the multidimensional, interconnected, and ever-changing influences on development.

Lifespan development involves the exploration of biological, cognitive, and psychosocial changes and constancies that occur throughout the entire course of life. It has been presented as a theoretical perspective, proposing several fundamental, theoretical, and methodological principles about the nature of human development. An attempt by researchers has been made to examine whether research on the nature of development suggests a specific metatheoretical worldview. Several beliefs, taken together, form the "family of perspectives" that contribute to this particular view.

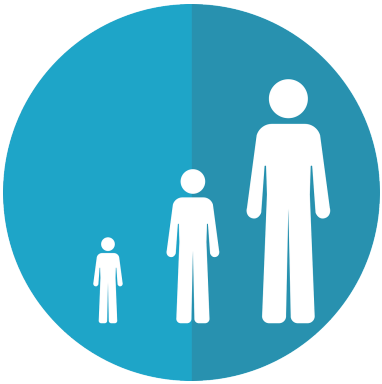

Figure 1*. Baltes' lifespan perspective emphasizes that development is lifelong, multidimensional, multidirectional, plastic, contextual, and multidisciplinary. Think of ways your own development fits in with each of these concepts as you read about the terms in more detail.*

German psychologist Paul Baltes, a leading expert on lifespan development and aging, developed one of the approaches to studying development called the **lifespan perspective**. This approach is based on several key principles:

- Development occurs across one's entire life, or is *lifelong*.
- Development is *multidimensional*, meaning it involves the dynamic interaction of factors like physical, emotional, and psychosocial development
- Development is *multidirectional* and results in gains and losses throughout life
- Development is *plastic*, meaning that characteristics are malleable or changeable.
- Development is influenced by *contextual* and socio-cultural influences.
- Development is *multidisciplinary*.

Development is Lifelong

Lifelong development means that change is not completed in infancy or childhood or at any specific age; it encompasses the entire lifespan, from conception to death. The study of development traditionally focused almost exclusively on the changes occurring from conception to adolescence and the gradual decline in old age; it was believed that the five or six decades after adolescence yielded little to no developmental change at all. The current view reflects the possibility that specific changes in development can occur later in life, without having been established at birth. Later events in one's life can transform the early events of one's childhood. This belief clearly emphasizes that all stages of the lifespan contribute to the regulation of the nature of human development.

Many diverse patterns of change, such as direction, timing, and order, can vary among individuals and affect how they develop. For example, the developmental timing of events can affect individuals in different ways because of their current level of maturity and understanding. As individuals move through life, they are faced with many challenges, opportunities, and situations that impact their development. Remembering that development is a lifelong process helps us gain a broader perspective on the meaning and impact of each event.

Development is Multidimensional

By multidimensionality, Baltes is referring to the fact that a complex interplay of factors influences development across the lifespan, including biological, cognitive, and socioemotional changes. Baltes argues that a dynamic interaction of these factors is what affects an individual's development.

For example, in adolescence, puberty consists of physiological

and physical changes with changes in hormone levels, the development of primary and secondary sex characteristics, alterations in height and weight, and several other bodily changes. But these are not the only types of changes taking place; there are also cognitive changes, including the development of advanced cognitive faculties such as the ability to think abstractly. There are also emotional and social changes involving regulating emotions, interacting with peers, and possibly dating. The fact that the term puberty encompasses such a broad range of domains illustrates the multidimensionality component of development (think back to the physical, cognitive, and psychosocial domains of human development we discussed earlier).

Development is Multidirectional

Baltes states that the development of a particular domain does not occur in a strictly linear fashion but that development of certain traits can be characterized as having the capacity for both an increase and a decrease in efficacy over the course of an individual's life.

If we use the example of puberty again, we can see that certain domains may improve or decline in effectiveness during this time. For example, self-regulation is one domain of puberty which undergoes profound multidirectional changes during the adolescent period. During childhood, individuals have difficulty effectively regulating their actions and impulsive behaviors. Scholars have noted that this lack of effective regulation often results in children engaging in behaviors without fully considering the consequences of their actions. Throughout puberty, neuronal changes modify this unregulated behavior by increasing the ability to regulate emotions and impulses. Inversely, the ability for adolescents to engage in spontaneous activity and creativity, both domains commonly associated with impulse behavior, decrease

over the adolescent period in response to changes in cognition. Neuronal changes to the limbic system and prefrontal cortex of the brain, which begin in puberty, lead to the development of self-regulation, and the ability to consider the consequences of one's actions (though recent brain research reveals that this connection will continue to develop into early adulthood).

Extending on the premise of multidirectionality, Baltes also argued that development is influenced by the "joint expression of features of growth (gain) and decline (loss)" (Baltes, 1987). This relation between developmental gains and losses occurs in a direction to selectively optimize particular capacities. This requires the sacrificing of other functions, a process known as selective optimization with compensation. According to the process of selective optimization, individuals prioritize particular functions above others, reducing the adaptive capacity of particulars for specialization and improved efficacy of other modalities.

The acquisition of effective self-regulation in adolescents illustrates this gain/loss concept. As adolescents gain the ability to regulate their actions effectively, they may be forced to sacrifice other features to selectively optimize their reactions. For example, individuals may sacrifice their capacity to be spontaneous or creative if they are constantly required to make thoughtful decisions and regulate their emotions. Adolescents may also be forced to sacrifice their fast reaction times toward processing stimuli in favor of being able to consider the consequences of their actions fully.

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Development is Plastic

Plasticity denotes intrapersonal variability and focuses heavily on the potentials and limits of the nature of human development. The notion of plasticity emphasizes that there are many possible developmental outcomes and that the nature of development is much more open and pluralistic than originally implied by traditional views; there is no single pathway that must be taken in an individual's development across the lifespan. Plasticity is imperative to current research because the potential for intervention is derived from the notion of plasticity in development. Undesired development or behaviors could potentially be prevented or changed.

As an example, recently, researchers have been analyzing how other senses compensate for the loss of vision in blind individuals. Without visual input, blind humans have demonstrated that tactile and auditory functions still fully develop, and they can use tactile and auditory cues to perceive the world around them. One experiment designed by Röder and colleagues (1999) compared the auditory localization skills of people who are blind with people who are sighted by having participants locate sounds presented either centrally or peripherally (lateral) to them. Both congenitally blind adults and sighted adults could locate a sound presented in front of them with precision, but people who are blind were superior in locating sounds presented laterally. Currently, brain-imaging studies have revealed that the sensory cortices in the brain are reorganized after visual deprivation. These findings suggest that when vision is absent in development, the auditory cortices in the brain recruit areas that are normally devoted to vision, thus becoming further refined.

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Development is Contextual

In Baltes' theory, the paradigm of contextualism refers to the idea that three systems of biological and environmental influences work together to influence development. Development occurs in context and varies from person to person, depending on factors such as a person's biology, family, school, church, profession, nationality, and ethnicity. Baltes identified three types of influences that operate throughout the life course: normative age-graded influences, normative history-graded influences, and non-normative influences. Baltes wrote that these three influences operate throughout the life course, their effects accumulate with time, and, as a dynamic package, they are responsible for how lives develop.

Normative age-graded influences are those biological and environmental factors that have a strong correlation with chronological age, such as puberty or menopause, or age-based social practices such as beginning school or entering retirement. **Normative history-graded influences** are associated with a specific time period that defines the broader environmental and cultural context in which an individual develops. For example, development and identity are influenced by historical events of the people who experience them, such as the Great Depression, WWII, Vietnam, the Cold War, the War on Terror, or advances in technology.

This has been exemplified in numerous studies, including

Nesselroade and Baltes', showing that the level and direction of change in adolescent personality development was influenced as strongly by the socio-cultural settings at the time (in this case, the Vietnam War) as age-related factors. The study involved individuals of four different adolescent age groups whom all showed significant personality development in the same direction (a tendency to occupy themselves with ethical, moral, and political issues rather than cognitive achievement). Similarly, Elder showed that the Great Depression was a setting that significantly affected the development of adolescents and their corresponding adult personalities by showing a similar common personality development across age groups. Baltes' theory also states that the historical socio-cultural setting had an effect on the development of an individual's intelligence. The areas of influence that Baltes thought most important to the development of intelligence were health, education, and work. The first two areas, health and education, significantly affect adolescent development because healthy children who are educated effectively will tend to develop a higher level of intelligence. The environmental factors, health and education, have been suggested by Neiss and Rowe to have as much effect on intelligence as inherited intelligence.

Non-normative influences are unpredictable and not tied to a certain time in a person's development or to a historical period. They are the unique experiences of an individual, whether biological or environmental, that shape the development process. These could include milestones like earning a master's degree or getting a certain job offer or other events like going through a divorce or coping with the death of a child.

The most important aspect of contextualism as a paradigm is that the three systems of influence work together to affect development. Concerning adolescent development, the age-graded influences would help to explain the similarities within a cohort, the history-graded influences would help to explain the differences between cohorts, and the non-normative influences would explain the idiosyncrasies of each adolescent's individual development. When

all influences are considered together, it provides a broader explanation of an adolescent's development.

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Other Contextual Influences on Development: Cohort, Socioeconomic Status, and Culture

What is meant by the word "context"? It means that we are influenced by when and where we live. Our actions, beliefs, and values are a response to the circumstances surrounding us. Sternberg describes contextual intelligence as the ability to understand what is called for in a situation (Sternberg, 1996). The key here is to understand that behaviors, motivations, emotions, and choices are all part of a bigger picture. Our concerns are such because of who we are socially, where we live, and when we live; they are part of a social climate and set of realities that surround us. Important social factors include cohort, social class, gender, race, ethnicity, and age. Let's begin by exploring two of these: cohort and social class.

A **cohort** is a group of people who are born at roughly the same time period in a particular society. Cohorts share histories and contexts for living. Members of a cohort have experienced the same historical events and cultural climates which have an impact on the values, priorities, and goals that may guide their lives. Consider the differences in experiences of someone from the 'Silent' generation

that lived with constant scarcity and rationing during WWII versus the economic prosperity that followed for the 'Baby Boomer' generation and how those historical contexts influence their development.

watch it

Video 1.4.1. *Generations Throughout History* describes the normative history-graded influences that shaped the development of seven generations over the past 125 years of United States history. Can you identify your generation? Does the description seem accurate?

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Another context that affects our lives is our social standing, socioeconomic status, or social class. **Socioeconomic status** is a way to identify families and households based on their shared levels of education, income, and occupation. While there is certainly individual variation, members of a social class tend to share similar lifestyles, patterns of consumption, parenting styles, stressors, religious preferences, and other aspects of daily life. We also find differences between social classes in these and other areas of development. Often, those in low socioeconomic groups, people

living in poverty, are disadvantaged, lack of opportunities, and have different life experiences than those with more financial stability and wealth.

Poverty describes the state of not having access to material resources, wealth, or income, and also includes the lack of opportunity to improve one's standard of living and acquire resources. **Life chances** is a term used to describe someone's access to marketplace resources—essentially, how likely it is in their environment that they might be able to find employment or have a social safety net. Someone who is living in poverty but has high life chances may be able to improve their economic standing, but someone with low life chances will likely have a consistently low standard of living. The term for a person's ability to change their economic status in a society is known as **social mobility**.

When families have low social mobility, they may become trapped in poverty for generations; we refer to this as the **cycle of poverty**. Typically, these families have either limited or nonexistent social and economic resources. There are many disadvantages that collectively work in a circular process to make it virtually impossible for individuals to break the cycle of poverty. They are less likely to have financial capital, education, job skills, reliable transportation, and social capital (connections to people with specialized knowledge or in power). Without these resources, poverty-stricken individuals experience disadvantages that, in turn, increase their poverty.

Additionally, those living in poverty suffer disproportionately from hunger, poor nutrition, and exhibit disproportionately high rates of physical and mental health issues. These illnesses can be disabling, preventing people in poverty from working, thus reducing one's opportunities to improve their social and economic status.

Finally, poverty increases the risk of homelessness. People who are homeless have low access to neighborhood resources, high-status social contacts, or basic services such as a phone line, limiting their ability to improve their economic position, again perpetuating poverty.

Culture is often referred to as a blueprint or guideline shared by a group of people that specifies how to live. It includes ideas about what is right and wrong, what to strive for, what to eat, how to speak, what is valued, as well as what kinds of emotions are called for in certain situations. Culture teaches us how to live in a society and allows us to advance because each new generation can benefit from the solutions found and passed down from previous generations.

Culture is learned from parents, schools, churches, media, friends, and others throughout a lifetime. The kinds of traditions and values that evolve in a particular culture serve to help members function in their society and to value their society. We tend to believe that our own culture's practices and expectations are the right ones. This belief that our own culture is superior is called ethnocentrism and is a normal by-product of growing up in a culture. It becomes a roadblock, however, when it inhibits understanding of cultural practices from other societies. Cultural relativity is an appreciation for cultural differences and the understanding that cultural practices are best understood from the standpoint of that particular culture.

Culture is a crucial context for human development, and understanding development requires being able to identify which features of development are culturally based. This understanding is somewhat new and still being explored. So much of what developmental theorists have described in the past has been culturally bound and difficult to apply to various cultural contexts. For example, Erikson's theory that teenagers struggle with identity assumes that all teenagers live in a society in which they have many options and must make an individual choice about their future. In many parts of the world, one's identity is determined by family status or society's dictates. In other words, there is no choice to make.

Even the most biological events can be viewed in cultural contexts that are incredibly varied. Consider two very different cultural responses to menstruation in young girls. In the United States, girls

in public schools often receive information on menstruation around 5th grade, get a kit containing feminine hygiene products, and receive some sort of education about sexual health. Contrast this with some developing countries where menstruation is not publicly addressed, or where girls on their period are forced to miss school due to limited access to feminine products or unjust attitudes about menstruation.

How Does socioeconomic status affect language development?

The achievement gap refers to the persistent difference in grades, test scores, and graduation rates that exist among students of different ethnicities, races, and—in certain subjects—sexes (Winerman, 2011). Research suggests that these achievement gaps are strongly influenced by differences in socioeconomic factors that exist among the families of these children. Low-income children perform significantly more poorly than their middle- and high-income peers on a number of educational variables: They have significantly lower standardized test scores, graduation rates, and college entrance rates, and they have much higher school dropout rates. Many of these problems start before the children even enter school.

Psychologists Betty Hart and Todd Risley (2006) spent their careers looking at early language ability and progression of children in various income levels. In one longitudinal study, researchers found that although all the parents in the study engaged and interacted with their children, middle- and high-income parents interacted with their children differently than low-income parents. The

researchers found that middle- and high-income parents talk to their children significantly more, starting when the children are infants. By age 3, high-income children knew almost double the number of words known by low-income children, and they heard about 30 million more words than the low-income counterparts (Hart & Risley, 2003). These gaps become more pronounced by kindergarten, with high-income children scoring 60% higher on achievement tests than their low-income peers (Lee & Burkam, 2002).

There are solutions to this problem. Experts are working with low-income families to encourage them to speak more to their children and designing preschools in which students from diverse economic backgrounds are placed in the same classroom (Schechter & Byeb, 2007).

Development is Multidisciplinary

Any single discipline's account of development across the lifespan would not be able to express all aspects of this theoretical framework. That is why it is suggested explicitly by lifespan researchers that a combination of disciplines is necessary to understand development. Psychologists, sociologists, neuroscientists, anthropologists, educators, economists, historians, medical researchers, and others may all be interested and involved in research related to the normative age-graded, normative history-graded, and nonnormative influences that help shape development. Many disciplines contribute important concepts that integrate knowledge, which may ultimately result in the formation of a new and enriched understanding of development across the lifespan.

THINK IT OVER

- Consider your cohort. Can you identify it? Does it have a name, and if so, what does the name imply? To what extent does your cohort shape your values, thoughts, and aspirations? (Some cohort labels popularized in the media for generations in the United States include Baby Boomers, Generation X, Millennials, and Generation Z.)
- Think of other ways culture may have affected your development. How might cultural differences influence interactions between teachers and students, nurses and patients, or other relationships?

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Glossary

continuous development: the idea that development is a progressive and cumulative process, gradually improving on existing skills

cohort: a group of people who are born at roughly the same period in a particular society. Cohorts share histories and contexts for living[/glossary-definition

culture: blueprint or guideline shared by a group of people that specifies how to live; passed down from generation to generation; learned from parents and others

cycle of poverty: when families with ow social mobility become trapped in poverty for generations

discontinuous development: idea that development takes place in unique stages and occurs at specific times or ages

life chances: someone's access to marketplace resources

lifespan perspective: an approach to studying development which emphasizes that development is lifelong, multidimensional, multidirectional, plastic, contextual, and multidisciplinary

nature: the influences of biology and genetics on behavior

non-normative influences: unpredictable influences not tied to a certain developmental time, personally or historical period

normative age-graded influences: biological and environmental factors that have a strong correlation with chronological age

normative history-graded influences: influences associated with a specific time period that define the broader bio-cultural context in which an individual develops

nurture: environmental, social, and cultural influences of behavior

poverty: the state of not having access to material resources, wealth, or income

social mobility: the ability to change one's economic status in a society

socioeconomic status: a way to identify families and households based on their shared levels of education, income, and occupation

PSYCHOLOGICAL RESEARCH

Learning outcomes

- Explain how the scientific method is used in researching development
- Compare various types and objectives of developmental research
- Describe methods for collecting research data (including observation, survey, case study, content analysis, and secondary content analysis)
- Explain correlational research
- Describe the value of experimental research
- Compare the advantages and disadvantages of developmental research designs (cross-sectional, longitudinal, and sequential)
- Describe challenges associated with conducting research in lifespan development

How do we know what changes and stays the same (and when and why) in development? We rely on research that utilizes the scientific method so that we can have confidence in the findings. How data are collected and analyzed vary by the type of information sought. The design of the study will affect the data and the conclusions that can be drawn from them about actual age changes.

Research in Development

An essential part of learning any science is having a basic knowledge of the techniques used in gathering information. The hallmark of scientific investigation is that of following a set of procedures designed to keep questioning or skepticism alive while describing, explaining, or testing any phenomenon. Not long ago, a friend said to me that he did not trust academicians or researchers because they always seem to change their story. That, however, is precisely what science is all about; it involves continuously renewing our understanding of the subjects in question and an ongoing investigation of how and why events occur. Science is a vehicle for going on a never-ending journey. In the area of development, we have seen changes in recommendations for nutrition, in explanations of psychological states as people age, and in parenting advice. So think of learning about human development as a lifelong endeavor.

Personal Knowledge

How do we know what we know? Take a moment to identify two things that you know about adolescence. Now, how do you know? Chances are you know these things based on your own history (experiential reality), what others have told you, or cultural ideas (agreement reality) (Seccombe and Warner, 2004). There are several problems with personal inquiry, or drawing conclusions based on our personal experiences. Read the following sentence aloud:

Paris in the
the spring

Are you sure that is what it said? Read it again.

If you read it differently the second time (adding the second

"the"), you just experienced one of the problems with relying on personal inquiry; that is, the tendency to see what we believe. Our assumptions very often guide our perceptions; consequently, when we believe something, we tend to see it even if it is not there. Have you heard the saying, "seeing is believing"? Well, the truth is just the opposite: believing is seeing. This problem may just be a result of cognitive 'blinders,' or it may be part of a more conscious attempt to support our own views. Confirmation bias is the tendency to look for evidence that we are right, and in so doing, we ignore contradictory evidence.

Philosopher Karl Popper suggested that the distinction between that which is scientific and that which is unscientific is that science is falsifiable; scientific inquiry involves attempts to reject or refute a theory or set of assumptions (Thornton, 2005). A theory that cannot be falsified is not scientific. And much of what we do in personal inquiry involves drawing conclusions based on what we have personally experienced or validating our own experience by discussing what we think is true with others who share the same views.

Science offers a more systematic way to make comparisons and guard against bias. One technique used to avoid sampling bias is to select participants for a study in a random way. This means using a technique to ensure that all members have an equal chance of being selected. Simple random sampling may involve using a set of random numbers as a guide in determining who is to be selected. For example, if we have a list of 400 people and wish to randomly select a smaller group or sample to be studied, we use a list of random numbers and select the case that corresponds with that number (Case 39, 3, 217, etc.). This is preferable to asking only those individuals with whom we are familiar to participate in a study; if we conveniently chose only people we know, we know nothing about those who had no opportunity to be selected. There are many more elaborate techniques that can be used to obtain samples that represent the composition of the population we are studying. But even though a randomly selected representative

sample is preferable, it is not always used because of costs and other limitations. As a consumer of research, however, you should know how the sample was obtained and keep this in mind when interpreting results. It is possible that what was found was limited to that sample or similar individuals and not generalizable to everyone else.

The Scientific Method

The general scientific approach has three fundamental features (Stanovich, 2010). The first is *systematic empiricism*. Empiricism refers to learning based on observation, and scientists learn about the natural world systematically, by carefully planning, making, recording, and analyzing observations of it. The second feature of the scientific approach is that it is concerned with *empirical questions*. These are questions about the way the world actually is and, therefore, can be answered by systematically observing it. The third feature is that it creates *public knowledge*. After asking empirical questions, making observations, and drawing their conclusions, scientists publish their work. This usually means writing an article for publication in a professional journal, in which they put their research question in the context of previous research, describe in detail the methods they used to answer their question, and clearly present their results and conclusions. Publication is an essential feature of science for two reasons. One is that science is a social process—a large-scale collaboration among many researchers distributed across both time and space. Our current scientific knowledge of most topics is based on many different studies conducted by many different researchers who have shared their work with each other over the years. The second is that publication allows science to be self-correcting. Individual scientists understand that despite their best efforts, their methods can be flawed, and their conclusions incorrect. Publication allows others in the scientific community to detect and correct these errors so that, over time, scientific knowledge increasingly reflects the way the world actually is.

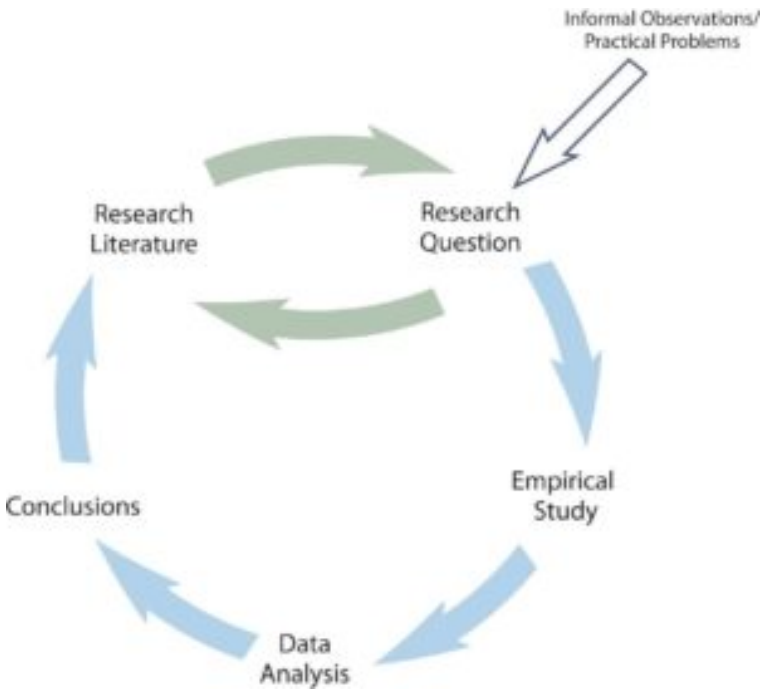

Figure 1. Simple model of scientific research in psychology.

Figure 2.2.1 is a simple model of scientific research in psychology and presents a more specific model of scientific research in psychology. The researcher (who more often than not is really a small group of researchers) formulates a research question, conducts a study designed to answer the question, analyzes the resulting data, draws conclusions about the answer to the question, and publishes the results so that they become part of the research literature. Because the research literature is one of the primary sources of new research questions, this process can be thought of as a cycle. New research leads to new questions, which leads to new research, and so on. The model also indicates that research questions can originate outside of this cycle, either with informal observations or with practical problems that need to be solved. But

even in these cases, the researcher would start by checking the research literature to see if the question had already been answered and to refine it based on what previous research had already found.

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Video 1. The Scientific Method explains the basic steps taken for most scientific inquiry.

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Qualitative and Quantitative Approaches to Research

If you think about the vast array of fields and topics covered in psychology, you understand that in order to do psychological research, there must be a diverse set of ways to gather data and perform experiments. For example, a biological psychologist might work predominately in a lab setting or alongside a neurologist. A social scientist may set up situational experiments, a health psychologist may administer surveys, and a developmental psychologist may make observations in a classroom. In this section, you'll learn about the various types of research methods that psychologists employ to learn about human behavior.

When designing a study, typically, researchers choose a quantitative or qualitative research design. In some cases, a mixed-method approach may be appropriate. Which approach used will develop on the research question and the type of information sought. Quantitative methods may be better for understanding what is happening, while qualitative methods may be better for understanding the hows and why of a phenomenon.

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Video 1. *Types of Research* explains the difference between qualitative and quantitative research. A closed-captioned version of this video is available here.

Quantitative Research

Quantitative research typically starts with a focused research question or hypothesis, collects a small amount of data from each of a large number of individuals, describes the resulting data using statistical techniques, and draws general conclusions about some large population. The strength of quantitative research is its ability to provide precise answers to specific research questions and to draw general conclusions about human behavior; however, it is not nearly as good at *generating* novel and interesting research questions. Likewise, while quantitative research is good at drawing general conclusions about human behavior, it is not nearly as good at providing detailed descriptions of the behavior of particular groups in particular situations. And it is not very good at all at communicating what it is actually like to be a member of a particular group in a particular situation. But the relative weaknesses of quantitative research are the relative strengths of qualitative research.

Qualitative Research

Although this is by far the most common approach to conducting empirical research in psychology, there is a vital alternative called **qualitative research**. Qualitative research can help researchers to generate new and interesting research questions and hypotheses. Qualitative researchers generally begin with a less focused research question, collect large amounts of relatively "unfiltered" data from a relatively small number of individuals, and describe their data using nonstatistical techniques. They are usually less concerned with drawing general conclusions about human behavior than with understanding in detail the *experience* of their research participants. Qualitative research can also provide rich and detailed descriptions of human behavior in the real-world contexts in which it occurs. Similarly, qualitative research can convey a sense of what it is actually like to be a member of a particular group or in a particular situation—what qualitative researchers often refer to as the 'lived experience' of the research participants.

Mixed-Methods

Given their differences, it may come as no surprise that quantitative and qualitative research do not coexist in complete harmony. Some quantitative researchers criticize that qualitative methods lack objectivity, are challenging to evaluate, and do not allow generalization to other people or situations. At the same time, some qualitative researchers criticize that quantitative methods overlook the richness of behavior and experience, and instead answer simple questions about easily quantifiable variables. However, many researchers from both camps now agree that the two approaches can and should be combined into what has come to be called mixed-methods research (Todd, Nerlich, McKeown, & Clarke, 2004). One

approach to combining quantitative and qualitative research is to use qualitative research for hypothesis generation and quantitative research for hypothesis testing. A second approach to combining quantitative and qualitative research is referred to as triangulation. The idea is to use both quantitative and qualitative methods simultaneously to study the same general questions and to compare the results. If the results of the quantitative and qualitative methods converge on the same general conclusion, they reinforce and enrich each other. If the results diverge, then they suggest an interesting new question: Why do the results diverge, and how can they be reconciled?

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Video 2. *What are Qualitative and Quantitative Variables* explains the difference between quantitative and qualitative variables that may be used in research.

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Becoming Familiar with Research

An excellent way to become more familiar with these research approaches, both quantitative and qualitative, is to look at journal articles, which are written in sections that follow these steps in the scientific process. Most psychological articles and many papers in the social sciences follow the writing guidelines and format dictated by the American Psychological Association (APA). In general, the structure follows: abstract (summary of the article), introduction or literature review, methods explaining how the study was conducted, results of the study, discussion and interpretation of findings, and references.

The aftermath of teenage suicide: a qualitative study of the psychosocial consequences for the supervising family

Per Lindqvist and his colleagues (2008), wanted to learn how the families of teenage suicide victims cope with their loss. They did not have a specific research question or hypothesis, such as, what percentage of family members join suicide support groups? Instead, they wanted to understand the variety of reactions that families had, with a focus on what it is like from *their* perspectives. To do this, they interviewed the families of 10 teenage suicide victims in their homes in rural Sweden. The interviews were relatively unstructured, beginning with a general request for the families to talk about the victim and ending with an invitation to talk about anything else that they wanted to tell the interviewer. One of the most important themes that

emerged from these interviews was that even as life returned to "normal," the families continued to struggle with the question of why their loved one committed suicide. This struggle appeared to be especially difficult for families in which the suicide was most unexpected. This relationship can now be explored using quantitative research. But it is unclear whether this question would have arisen at all without the researchers sitting down with the families and listening to what they themselves wanted to say about their experience.

Descriptive Research

There are many research methods available to psychologists in their efforts to understand, describe, and explain behavior. Some methods rely on observational techniques. Other approaches involve interactions between the researcher and the individuals who are being studied—ranging from a series of simple questions to extensive, in-depth interviews—to well-controlled experiments. The main categories of psychological research are descriptive, correlational, and experimental research. Each of these research methods has unique strengths and weaknesses, and each method may only be appropriate for certain types of research questions.

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Research studies that do not test specific relationships between variables are called **descriptive studies**. For this method, the research question or hypothesis can be about a single variable (e.g., How accurate are people's first impressions?) or can be a broad and exploratory question (e.g., What is it like to be a working mother diagnosed with depression?). The variable of the study is measured and reported without any further relationship analysis. A researcher might choose this method if they only needed to report information, such as a tally, an average, or a list of responses. Descriptive research can answer interesting and important questions, but what it cannot do is answer questions about relationships between variables.

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Video 1. *Descriptive Research Design* provides explanation and examples for quantitative descriptive research. A closed-captioned version of this video is available here.

Descriptive research is distinct from **correlational research**, in which researchers formally test whether a relationship exists between two or more variables. **Experimental research** goes a step further beyond descriptive and correlational research and randomly assigns people to different conditions, using hypothesis testing to make inferences about causal relationships between variables. We will discuss each of these methods more in-depth later.

Table 1. Comparison of research design methods

Research design	Goal	Advantages	Disadvantages
Descriptive	To create a snapshot of the current state of affairs	Provides a relatively complete picture of what is occurring at a given time. Allows the development of questions for further study.	Does not assess relationships among variables. May be unethical if participants do not know they are being observed.
Correlational	To assess the relationships between and among two or more variables	Allows testing of expected relationships between and among variables and the making of predictions. Can assess these relationships in everyday life events.	Cannot be used to draw inferences about the causal relationships between and among the variables.
Experimental	To assess the causal impact of one or more experimental manipulations on a dependent variable	Allows drawing of conclusions about the causal relationships among variables.	Cannot experimentally manipulate many important variables. May be expensive and time-consuming.

Source: Stangor, 2011.

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Methods of Data Collection

Regardless of the method of research, data collection will be necessary. The method of data collection selected will primarily depend on the type of information the researcher needs for their study; however, other factors, such as time, resources, and even ethical considerations can influence the selection of a data collection method. All of these factors need to be considered when selecting a data collection method because each method has unique strengths and weaknesses. We will discuss the uses and assessment of the most common data collection methods: observation, surveys, archival data, and tests.

Observation

The observational method involves the watching and recording of a specific behavior of participants. In general, observational studies have the strength of allowing the researcher to see for themselves how people behave. However, observations may require more time and man-power than other data collection methods, often resulting in smaller samples of participants. Researchers may spend significant time waiting to observe a behavior, or the behavior may never occur during observation. It is important to remember that people tend to change their behavior when they know they are being watched (known as the **Hawthorne effect**).

Observations may be done in a naturalist setting to reduce the likelihood of the Hawthorne effect. During naturalistic observations, the participants are in their natural environment and are usually unaware that they are being observed. For example, observing students participating in their class would be a naturalist observation. The downside of a naturalistic setting is that the research doesn't have control over the environment. Imagine that

the researcher goes to the classroom to observe those students, and there is a substitute teacher. The change in instructor that day could impact student behavior and skew the data.

If controlling the environment is a concern, a laboratory setting may be a better choice. In the laboratory environment, the researcher can manage confounding factors or distractions that might impact the participants' behavior. Of course, there are expenses associated with maintaining a laboratory setting, increasing the cost of the study, that would not be associated with naturalist observations. And, again, the Hawthorne effect may impact behavior.

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Surveys

Surveys are familiar to most people because they are so widely used. This method enhances accessibility to subjects because they can be conducted in person, over the phone, through the mail, or online, and are commonly used by researchers to gather information on many variables in a relatively short period of time.

Most surveys involve asking a standard set of questions to a group of participants. In a highly structured survey, subjects are forced to choose from a response set such as "strongly disagree, disagree, undecided, agree, strongly agree"; or "0, 1-5, 6-10, etc." One of the benefits of having forced-choice items is that each response is coded so that the results can be quickly entered and analyzed using statistical software. While this type of survey typically yields surface information on a wide variety of factors, they may not allow for an in-depth understanding of human behavior.

Of course, surveys can be designed in a number of ways. Some surveys ask open-ended questions, allowing each participant to devise their own response, allowing for a variety of answers. This variety may provide deeper insight into the subject than forced-choice questions, but makes comparing answers challenging. Imagine a survey question that asked participants to report how they are feeling today. If there were 100 participants, there could be 100 different answers, which is more challenging and takes more time to code and analyze.

Surveys are useful in examining stated values, attitudes, opinions, and reporting on practices. However, they are based on self-report, and this can limit accuracy. For a variety of reasons, people may not provide honest or complete answers. Participants may be concerned with projecting a particular image through their responses, they may be uncomfortable answering the questions, inaccurately assess their behavior, or they may lack awareness of the behavior being assessed. So, while surveys can provide a lot of information for many participants quickly and easily, the self-reporting may not be as accurate as other methods.

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Content Analysis of Archival data

Content analysis involves looking at media such as old texts, pictures, commercials, lyrics, or other materials to explore patterns or themes in culture. An example of content analysis is the classic history of childhood by Aries (1962) called "Centuries of Childhood" or the analysis of television commercials for sexual or violent content or for ageism. Passages in text or television programs can be randomly selected for analysis as well. Again, one advantage of analyzing work such as this is that the researcher does not have to go through the time and expense of finding respondents, but the researcher cannot know how accurately the media reflects the actions and sentiments of the population.

Secondary content analysis, or archival research, involves analyzing information that has already been collected or examining documents or media to uncover attitudes, practices, or preferences. There are a number of data sets available to those who wish to conduct this type of research. The researcher conducting secondary analysis does not have to recruit subjects but does need to know the quality of the information collected in the original study. And unfortunately, the researcher is limited to the questions asked and data collected originally.

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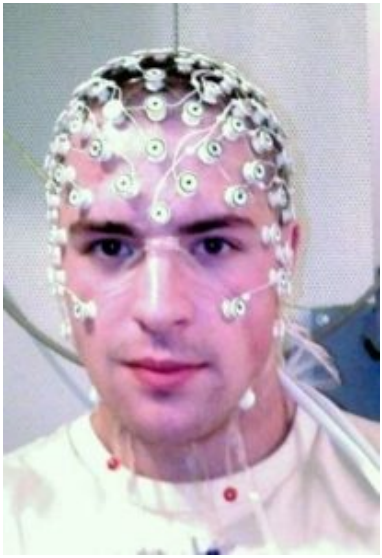
Tests



Many variables studied by psychologists—perhaps the majority—are not so straightforward or simple to measure. These kinds of variables are called constructs and include personality traits, emotional states, attitudes, and abilities. Psychological constructs cannot be observed directly. One reason is that they often represent *tendencies* to think, feel, or act in certain ways. For example, to say that a particular college student is highly extroverted does not necessarily mean that she is behaving in an extroverted way right now. Another reason psychological constructs cannot be observed directly is that they often involve internal processes, like thoughts or feelings. For these psychological constructs, we need another means for collecting data. Tests will serve this purpose.

A good test will aid researchers in assessing a particular

psychological construct. What is a good test? Researchers want a test that is standardized, reliable, and valid. A standardized test is one that is administered, scored, and analyzed in the same way for each participant. This minimizes differences in test scores due to confounding factors, such as variability in the testing environment or scoring process, and assures that scores are comparable. Reliability refers to the consistency of a measure. Researchers consider three types of consistency: over time (test-retest reliability), across items (internal consistency), and across different researchers (interrater reliability). Validity is the extent to which the scores from a measure represent the variable they are intended to. When a measure has good test-retest reliability and internal consistency, researchers should be more confident that the scores represent what they are supposed to.

There are various types of tests used in psychological research. Self-report measures are those in which participants report on their own thoughts, feelings, and actions, such as the Rosenberg Self-Esteem Scale or the Big Five Personality Test. Some tests measure performance, ability, aptitude, or skill, like the Stanford-Binet Intelligence Scale or the SATs.There are also tests that measure physiological states, including electrical activity or blood flow in the brain.

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Video 2.5.1. *Methods of Data Collection* explains various means for gathering data for quantitative and qualitative research. A closed-captioned version of this video is available here.

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Reliability and Validity

Reliability and **validity** are two important considerations that must be made with any type of data collection. Reliability refers to the ability to consistently produce a given result. In the context of psychological research, this would mean that any instruments or tools used to collect data do so in consistent, reproducible ways. Unfortunately, being consistent in measurement does not necessarily mean that you have measured something correctly. To illustrate this concept, consider a kitchen scale that would be used to measure the weight of cereal that you eat in the morning. If the scale is not properly calibrated, it may consistently under- or overestimate the amount of cereal that's being measured. While the scale is highly reliable in producing consistent results (e.g., the same amount of cereal poured onto the scale produces the same reading each time), those results are incorrect. This is where validity comes into play. Validity refers to the extent to which a given instrument or tool accurately measures what it's supposed to measure. While any valid measure is by necessity reliable, the reverse is not necessarily true. Researchers strive to use instruments that are both highly reliable and valid.
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Everyday Connection: How Valid Is the SAT?

Standardized tests like the SAT are supposed to measure an individual's aptitude for a college education, but how reliable and valid are such tests? Research conducted by the College Board suggests that scores on the SAT have high predictive validity for first-year college students' GPA (Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008). In this context, predictive validity refers to the test's ability to effectively predict the GPA of college freshmen. Given that many institutions of higher education require the SAT for admission, this high degree of predictive validity might be comforting.

However, the emphasis placed on SAT scores in college admissions has generated some controversy on a number of fronts. For one, some researchers assert that the SAT is a biased test that places minority students at a disadvantage and unfairly reduces the likelihood of being admitted into a college (Santelices & Wilson, 2010). Additionally, some research has suggested that the predictive validity of the SAT is grossly exaggerated in how well it is able to predict the GPA of first-year college students. In fact, it has been suggested that the SAT's predictive validity may be overestimated by as much as 150% (Rothstein, 2004). Many institutions of higher education are beginning to consider de-emphasizing the significance of SAT scores in making admission decisions (Rimer, 2008).

In 2014, College Board president David Coleman expressed his awareness of these problems, recognizing that college success is more accurately predicted by high

school grades than by SAT scores. To address these concerns, he has called for significant changes to the SAT exam (Lewin, 2014).

Analyzing Data: Correlational and Experimental Research

Did you know that as sales of ice cream increase, so does the overall rate of crime? Is it possible that indulging in your favorite flavor of ice cream could send you on a crime spree? Or, after committing a crime, do you think you might decide to treat yourself to a cone? There is no question that a relationship exists between ice cream and crime (e.g., Harper, 2013), but does one thing actually caused the other to occur.

It is much more likely that both ice cream sales and crime rates are related to the temperature outside. When the temperature is warm, there are lots of people out of their houses, interacting with each other, getting annoyed with one another, and sometimes committing crimes. Also, when it is warm outside, we are more likely to seek a refreshing treat like ice cream. How do we determine if there is indeed a relationship between two things? And when there is a relationship, how can we discern whether it is attributable to coincidence or causation? We do this through statistical analysis of the data. Which analysis we use will depend on several conditions outlined next.

Introduction to Statistical Thinking

***Figure 1**. People around the world differ in their preferences for drinking coffee versus drinking tea. Would the results of the coffee study be the same in Canada as in China? [Image: Duncan, https://goo.gl/vbMyTm, CC BY-NC 2.0, https://goo.gl/l8UUGY]*

Does drinking coffee actually increase your life expectancy? A recent study (Freedman, Park, Abnet, Hollenbeck, & Sinha, 2012) found that men who drank at least six cups of coffee a day had a 10% lower chance of dying (women 15% lower) than those who drank none. Does this mean you should pick up or increase your own coffee habit? Modern society has become awash in studies such as this; you can read about several such studies in the news every day. Conducting such a study well, and interpreting the results of such studies requires understanding basic ideas of **statistics**, the science of gaining insight from data. Key components to a statistical investigation are:

- Planning the study: Start by asking a testable research question and deciding how to collect data. For example, how long was the study period of the coffee study? How many people were recruited for the study, how were they recruited, and from where? How old were they? What other variables were recorded about the individuals? Were changes made to the participants' coffee habits during the course of the study?
- Examining the data: What are appropriate ways to examine the data? What graphs are relevant, and what do they reveal? What descriptive statistics can be calculated to summarize relevant aspects of the data, and what do they reveal? What patterns do you see in the data? Are there any individual observations that deviate from the overall pattern, and what do they reveal? For

example, in the coffee study, did the proportions differ when we compared the smokers to the non-smokers?

- Inferring from the data: What are valid statistical methods for drawing inferences "beyond" the data you collected? In the coffee study, is the 10%–15% reduction in risk of death something that could have happened just by chance?
- Drawing conclusions: Based on what you learned from your data, what conclusions can you draw? Who do you think these conclusions apply to? (Were the people in the coffee study older? Healthy? Living in cities?) Can you draw a **cause-and-effect** conclusion about your treatments? (Are scientists now saying that the coffee drinking is the cause of the decreased risk of death?)

Notice that the numerical analysis ("crunching numbers" on the computer) comprises only a small part of overall statistical investigation. In this section, you will see how we can answer some of these questions and what questions you should be asking about any statistical investigation you read about.

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Video 1. *Types of Statistical Studies* explains the differences between correlational and experimental research.

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Distributional Thinking

When data are collected to address a particular question, an important first step is to think of meaningful ways to organize and examine the data. Let's take a look at an example.

Example 1: Researchers investigated whether cancer pamphlets are written at an appropriate level to be read and understood by cancer patients (Short, Moriarty, & Cooley, 1995). Tests of reading ability were given to 63 patients. In addition, readability level was determined for a **sample** of 30 pamphlets, based on characteristics such as the lengths of words and sentences in the pamphlet. The results, reported in terms of grade levels, are displayed in Figure 2.

Patients' reading levels	< 3	3	4	5	6	7	8	9	10	11	12	> 12	Total
Count (number of patients)	6	4	4	3	3	2	6	5	4	7	2	17	63

Pamphlet's readability levels	6	7	8	9	10	11	12	13	14	15	16	Total
Count (number of pamphlets)	3	3	8	4	1	1	4	2	1	2	1	30

***Figure 2**. Frequency tables of patient reading levels and pamphlet readability levels.*

Testing these two variables reveal two fundamental aspects of statistical thinking:

- Data *vary*. More specifically, values of a variable (such as

reading level of a cancer patient or readability level of a cancer pamphlet) vary.
- Analyzing the pattern of variation, called the **distribution** of the variable, often reveals insights.

Addressing the research question of whether the cancer pamphlets are written at appropriate levels for the cancer patients requires comparing the two distributions. A naïve comparison might focus only on the centers of the distributions. Both medians turn out to be ninth grade, but considering only medians ignores the variability and the overall distributions of these data. A more illuminating approach is to compare the entire distributions, for example with a graph, as in Figure 3.

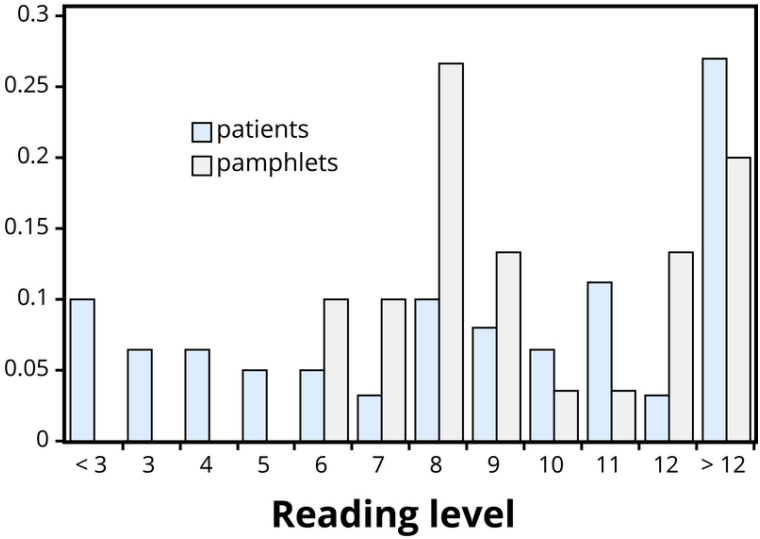

Figure 3. *Comparison of patient reading levels and pamphlet readability levels.*

Figure 3 makes clear that the two distributions are not well aligned at all. The most glaring discrepancy is that many patients (17/63, or 27%, to be precise) have a reading level below that of the most

readable pamphlet. These patients will need help to understand the information provided in the cancer pamphlets. Notice that this conclusion follows from considering the distributions as a whole, not simply measures of center or variability, and that the graph contrasts those distributions more immediately than the frequency tables.

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Statistical Significance

Even when we find patterns in data, often there is still uncertainty in various aspects of the data. For example, there may be potential for measurement errors (even your own body temperature can fluctuate by almost 1°F over the course of the day). Or we may only have a "snapshot" of observations from a more long-term process or only a small subset of individuals from the **population** of interest. In such cases, how can we determine whether patterns we see in our small set of data is convincing evidence of a systematic phenomenon in the larger process or population? Let's take a look at another example.

Example 2: In a study reported in the November 2007 issue of *Nature*, researchers investigated whether pre-verbal infants take into account an individual's actions toward others in evaluating that individual as appealing or aversive (Hamlin, Wynn, & Bloom, 2007). In one component of the study, 10-month-old infants were shown a

“climber” character (a piece of wood with “googly” eyes glued onto it) that could not make it up a hill in two tries. Then the infants were shown two scenarios for the climber’s next try, one where the climber was pushed to the top of the hill by another character (“helper”), and one where the climber was pushed back down the hill by another character (“hinderer”). The infant was alternately shown these two scenarios several times. Then the infant was presented with two pieces of wood (representing the helper and the hinderer characters) and asked to pick one to play with.

The researchers found that of the 16 infants who made a clear choice, 14 chose to play with the helper toy. One possible explanation for this clear majority result is that the helping behavior of the one toy increases the infants’ likelihood of choosing that toy. But are there other possible explanations? What about the color of the toy? Well, prior to collecting the data, the researchers arranged so that each color and shape (red square and blue circle) would be seen by the same number of infants. Or maybe the infants had right-handed tendencies and so picked whichever toy was closer to their right hand?

Well, prior to collecting the data, the researchers arranged it so half the infants saw the helper toy on the right and half on the left. Or, maybe the shapes of these wooden characters (square, triangle, circle) had an effect? Perhaps, but again, the researchers controlled for this by rotating which shape was the helper toy, the hinderer toy, and the climber. When designing experiments, it is important to *control* for as many variables as might affect the responses as possible. It is beginning to appear that the researchers accounted for all the other plausible explanations. But there is one more important consideration that cannot be controlled—if we did the study again with these 16 infants, they might not make the same choices. In other words, there is some *randomness* inherent in their selection process.

P-value

Maybe each infant had no genuine preference at all, and it was simply "random luck" that led to 14 infants picking the helper toy. Although this random component cannot be controlled, we can apply a *probability model* to investigate the pattern of results that would occur in the long run if random chance were the only factor.

If the infants were equally likely to pick between the two toys, then each infant had a 50% chance of picking the helper toy. It's like each infant tossed a coin, and if it landed heads, the infant picked the helper toy. So if we tossed a coin 16 times, could it land heads 14 times? Sure, it's possible, but it turns out to be very unlikely. Getting 14 (or more) heads in 16 tosses is about as likely as tossing a coin and getting 9 heads in a row. This probability is referred to as a **p-value**. The p-value represents the likelihood that experimental results happened by chance. Within psychology, the most common standard for p-values is "$p < .05$". What this means is that there is less than a 5% probability that the results happened just by random chance, and therefore a 95% probability that the results reflect a meaningful pattern in human psychology. We call this **statistical significance**.

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So, in the study above, if we assume that each infant was choosing equally, then the probability that 14 or more out of 16 infants would choose the helper toy is found to be 0.0021. We have only two logical possibilities: either the infants have a genuine preference for

the helper toy, or the infants have no preference (50/50), and an outcome that would occur only 2 times in 1,000 iterations happened in this study. Because this p-value of 0.0021 is quite small, we conclude that the study provides very strong evidence that these infants have a genuine preference for the helper toy.

If we compare the p-value to some cut-off value, like 0.05, we see that the p=value is smaller. Because the p-value is smaller than that cut-off value, then we reject the hypothesis that only random chance was at play here. In this case, these researchers would conclude that *significantly* more than half of the infants in the study chose the helper toy, giving strong evidence of a genuine preference for the toy with the helping behavior.

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Generalizability

***Figure 4**. Generalizability is an important research consideration: The results of studies with widely representative samples are more likely to generalize to the population. [Image: Barnacles Budget Accommodation]*

One limitation to the study mentioned previously about the babies choosing the "helper" toy is that the conclusion only applies to the 16 infants in the study. We don't know much about how those 16 infants were selected. Suppose we want to select a subset of individuals (a **sample**) from a much larger group of individuals (the **population**) in such a way that conclusions from the sample can be **generalized** to the larger population. This is the question faced by pollsters every day.

Example 3: The General Social Survey (GSS) is a survey on societal trends conducted every other year in the United States. Based on a sample of about 2,000 adult Americans, researchers make claims about what percentage of the U.S. population consider themselves to be "liberal," what percentage consider themselves "happy," what percentage feel "rushed" in their daily lives, and many other issues. The key to making these claims about the larger population of all American adults lies in how the sample is selected. The goal is to select a sample that is representative of the population, and a common way to achieve this goal is to select a **random sample** that gives every member of the population an equal chance of being selected for the sample. In its simplest form, random sampling involves numbering every member of the population and then using a computer to randomly select the subset to be surveyed. Most polls don't operate exactly like this, but they do use probability-based sampling methods to select individuals from nationally representative panels.

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In 2004, the GSS reported that 817 of 977 respondents (or 83.6%) indicated that they always or sometimes feel rushed. This is a clear majority, but we again need to consider variation due to *random sampling*. Fortunately, we can use the same probability model we did in the previous example to investigate the probable size of this error. (Note, we can use the coin-tossing model when the actual population size is much, much larger than the sample size, as then we can still consider the probability to be the same for every individual in the sample.) This probability model predicts that the sample result will be within 3 percentage points of the population value (roughly 1 over the square root of the sample size, the **margin of error**). A statistician would conclude, with 95% confidence, that between 80.6% and 86.6% of all adult Americans in 2004 would have responded that they sometimes or always feel rushed.

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The key to the margin of error is that when we use a probability sampling method, we can make claims about how often (in the long

run, with repeated random sampling) the sample result would fall within a certain distance from the unknown population value by chance (meaning by random sampling variation) alone. Conversely, non-random samples are often suspect to bias, meaning the sampling method systematically over-represents some segments of the population and under-represents others. We also still need to consider other sources of bias, such as individuals not responding honestly. These sources of error are not measured by the margin of error.

Cause and Effect Conclusions

In many research studies, the primary question of interest concerns differences between groups. Then the question becomes how were the groups formed (e.g., selecting people who already drink coffee vs. those who don't). In some studies, the researchers actively form the groups themselves. But then we have a similar question—could any differences we observe in the groups be an artifact of that group-formation process? Or maybe the difference we observe in the groups is so large that we can discount a "fluke" in the group-formation process as a reasonable explanation for what we find?

Example 4: A psychology study investigated whether people tend to display more creativity when they are thinking about intrinsic (internal) or extrinsic (external) motivations (Ramsey & Schafer, 2002, based on a study by Amabile, 1985). The subjects were 47 people with extensive experience with creative writing. Subjects began by answering survey questions about either intrinsic motivations for writing (such as the pleasure of self-expression) or extrinsic motivations (such as public recognition). Then all subjects were instructed to write a haiku, and those poems were evaluated for creativity by a panel of judges. The researchers conjectured beforehand that subjects who were thinking about intrinsic motivations would display more creativity than subjects who were

thinking about extrinsic motivations. The creativity scores from the 47 subjects in this study are displayed in Figure 5, where higher scores indicate more creativity.

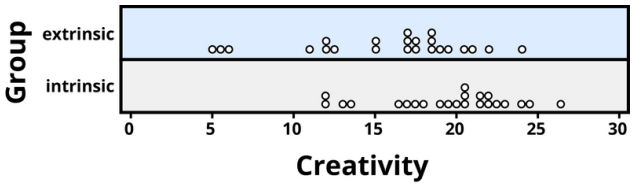

Figure 5*. Creativity scores separated by type of motivation.*

In this example, the key question is whether the type of motivation *affects* creativity scores. In particular, do subjects who were asked about intrinsic motivations tend to have higher creativity scores than subjects who were asked about extrinsic motivations?

Figure 5 reveals that both motivation groups saw considerable variability in creativity scores, and these scores have considerable overlap between the groups. In other words, it's certainly not always the case that those with extrinsic motivations have higher creativity than those with intrinsic motivations, but there may still be a statistical *tendency* in this direction. (Psychologist Keith Stanovich (2013) refers to people's difficulties with thinking about such probabilistic tendencies as "the Achilles heel of human cognition.")

The mean creativity score is 19.88 for the intrinsic group, compared to 15.74 for the extrinsic group, which supports the researchers' conjecture. Yet comparing only the means of the two groups fails to consider the variability of creativity scores in the groups. We can measure variability with statistics using, for instance, the standard deviation: 5.25 for the extrinsic group and 4.40 for the intrinsic group. The standard deviations tell us that most of the creativity scores are within about 5 points of the mean score in each group. We see that the mean score for the intrinsic group lies within one standard deviation of the mean score for extrinsic group. So, although there is a tendency for the creativity

scores to be higher in the intrinsic group, on average, the difference is not extremely large.

We again want to consider possible explanations for this difference. The study only involved individuals with extensive creative writing experience. Although this limits the population to which we can generalize, it does not explain why the mean creativity score was a bit larger for the intrinsic group than for the extrinsic group. Maybe women tend to receive higher creativity scores? Here is where we need to focus on how the individuals were assigned to the motivation groups. If only women were in the intrinsic motivation group and only men in the extrinsic group, then this would present a problem because we wouldn't know if the intrinsic group did better because of the different type of motivation or because they were women. However, the researchers guarded against such a problem by randomly assigning the individuals to the motivation groups. Like flipping a coin, each individual was just as likely to be assigned to either type of motivation. Why is this helpful? Because this **random assignment** tends to balance out all the variables related to creativity we can think of, and even those we don't think of in advance, between the two groups. So we should have a similar male/female split between the two groups; we should have a similar age distribution between the two groups; we should have a similar distribution of educational background between the two groups; and so on. Random assignment should produce groups that are as similar as possible except for the type of motivation, which presumably eliminates all those other variables as possible explanations for the observed tendency for higher scores in the intrinsic group.

But does this always work? No, so by "luck of the draw" the groups may be a little different prior to answering the motivation survey. So then the question is, is it possible that an unlucky random assignment is responsible for the observed difference in creativity scores between the groups? In other words, suppose each individual's poem was going to get the same creativity score no matter which group they were assigned to, that the type of

motivation in no way impacted their score. Then how often would the random-assignment process alone lead to a difference in mean creativity scores as large (or larger) than 19.88 – 15.74 = 4.14 points?

We again want to apply to a probability model to approximate a **p-value**, but this time the model will be a bit different. Think of writing everyone's creativity scores on an index card, shuffling up the index cards, and then dealing out 23 to the extrinsic motivation group and 24 to the intrinsic motivation group, and finding the difference in the group means. We (better yet, the computer) can repeat this process over and over to see how often, when the scores don't change, random assignment leads to a difference in means at least as large as 4.41. Figure 6 shows the results from 1,000 such hypothetical random assignments for these scores.

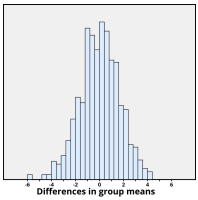

Figure 6. *Differences in group means under random assignment alone.*

Only 2 of the 1,000 simulated random assignments produced a difference in group means of 4.41 or larger. In other words, the approximate p-value is 2/1000 = 0.002. This small p-value indicates that it would be very surprising for the random assignment process alone to produce such a large difference in group means. Therefore, as with Example 4, we have strong evidence that focusing on intrinsic motivations tends to increase creativity scores, as compared to thinking about extrinsic motivations.

Notice that the previous statement implies a cause-and-effect relationship between motivation and creativity score; is such a strong conclusion justified? Yes, because of the random assignment used in the study. That should have balanced out any other variables between the two groups, so now that the small p-value convinces us that the higher mean in the intrinsic group wasn't just a coincidence, the only reasonable explanation left is the difference in the type of motivation. Can we generalize this conclusion to everyone? Not necessarily—we could cautiously generalize this conclusion to individuals with extensive experience in creative

writing similar to the individuals in this study, but we would still want to know more about how these individuals were selected to participate.

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Conclusion

***Figure 7**. Researchers employ the scientific method that involves a great deal of statistical thinking: generate a hypothesis –> design a study to test that hypothesis –> conduct the study –> analyze the data –> report the results. [Image: widdowquinn]*

Statistical thinking involves the careful design of a study to collect meaningful data to answer a focused research question, detailed analysis of patterns in the data, and drawing conclusions that go beyond the observed data. Random sampling is paramount to generalizing results from our sample to a larger population, and random assignment is key to drawing cause-and-effect conclusions. With both kinds of randomness, probability models help us assess how much random variation we can expect in our results, in order to determine whether our results could happen by chance alone and to estimate a margin of error.

So where does this leave us with regard to the coffee study mentioned previously (the Freedman, Park, Abnet, Hollenbeck, & Sinha, 2012 found that men who drank at least six cups of coffee a day had a 10% lower chance of dying (women 15% lower) than those who drank none)? We can answer many of the questions:

- This was a 14-year study conducted by researchers at the National Cancer Institute.
- The results were published in the June issue of the *New England Journal of Medicine*, a respected, peer-reviewed journal.
- The study reviewed coffee habits of more than 402,000 people ages 50 to 71 from six states and two metropolitan areas. Those with cancer, heart disease, and stroke were excluded at the start of the study. Coffee consumption was assessed once at the start of the study.
- About 52,000 people died during the course of the study.
- People who drank between two and five cups of coffee daily showed a lower risk as well, but the amount of reduction increased for those drinking six or more cups.
- The sample sizes were fairly large and so the p-values are quite small, even though percent reduction in risk was not extremely large (dropping from a 12% chance to about 10%–11%).
- Whether coffee was caffeinated or decaffeinated did not appear to affect the results.
- This was an observational study, so no cause-and-effect conclusions can be drawn between coffee drinking and increased longevity, contrary to the impression conveyed by many news headlines about this study. In particular, it's possible that those with chronic diseases don't tend to drink coffee.

This study needs to be reviewed in the larger context of similar studies and consistency of results across studies, with the constant caution that this was not a randomized experiment. Whereas a

statistical analysis can still "adjust" for other potential confounding variables, we are not yet convinced that researchers have identified them all or completely isolated why this decrease in death risk is evident. Researchers can now take the findings of this study and develop more focused studies that address new questions.

Learn More

Explore these outside resources to learn more about applied statistics:

- Video about p-values: P-Value Extravaganza
- Interactive web applets for teaching and learning statistics
- Inter-university Consortium for Political and Social Research where you can find and analyze data.
- The Consortium for the Advancement of Undergraduate Statistics

Correlational Research

Correlation means that there is a relationship between two or more variables (such as ice cream consumption and crime), but this relationship does not necessarily imply cause and effect. When two variables are correlated, it simply means that as one variable changes, so does the other. We can measure correlation by calculating a statistic known as a correlation coefficient. A **correlation coefficient** is a number from -1 to +1 that indicates the strength and direction of the relationship between variables. The correlation coefficient is usually represented by the letter *r*.

The number portion of the correlation coefficient indicates the strength of the relationship. The closer the number is to 1 (be it negative or positive), the more strongly related the variables are, and the more predictable changes in one variable will be as the other variable changes. The closer the number is to zero, the weaker the relationship and the less predictable the relationship between the variables becomes. For instance, a correlation coefficient of 0.9 indicates a far stronger relationship than a correlation coefficient of 0.3. If the variables are not related to one another at all, the correlation coefficient is 0. The example above about ice cream and crime is an example of two variables that we might expect to have no relationship to each other.

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The sign—positive or negative—of the correlation coefficient

indicates the direction of the relationship (Figure 2.7.1). A **positive correlation** means that the variables move in the same direction. Put another way, it means that as one variable increases so does the other, and conversely, when one variable decreases so does the other. A **negative correlation** means that the variables move in opposite directions. If two variables are negatively correlated, a decrease in one variable is associated with an increase in the other and vice versa.

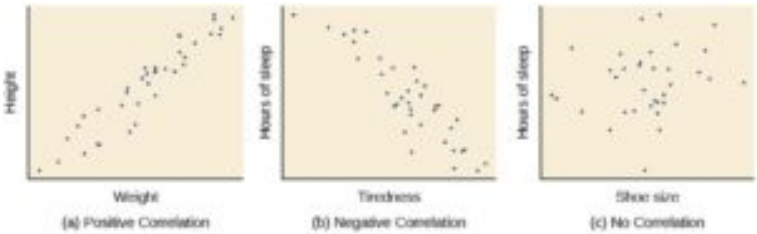

Figure 1. Scatterplots are a graphical view of the strength and direction of correlations. The stronger the correlation, the closer the data points are to a straight line. In these examples, we see that there is (a) a positive correlation between weight and height, (b) a negative correlation between tiredness and hours of sleep, and (c) no correlation between shoe size and hours of sleep.

The example of ice cream and crime rates is a positive correlation because both variables increase when temperatures are warmer. Other examples of positive correlations are the relationship between an individual's height and weight or the relationship between a person's age and number of wrinkles. One might expect a negative correlation to exist between someone's tiredness during the day and the number of hours they slept the previous night: the amount of sleep decreases as the feelings of tiredness increase. In a real-world example of negative correlation, student researchers at the University of Minnesota found a weak negative correlation (r = -0.29) between the average number of days per week that students got fewer than 5 hours of sleep and their GPA (Lowry, Dean, &

Manders, 2010). Keep in mind that a negative correlation is not the same as no correlation. For example, we would probably find no correlation between hours of sleep and shoe size.

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Video 1. *Correlational Research Design* provides explanation and examples for correlational research. A closed-captioned version of this video is available here.

Exercises

Manipulate this interactive scatterplot to practice your understanding of positive and negative correlations.

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As mentioned earlier, correlations have predictive value. Imagine

that you are on the admissions committee of a major university. You are faced with a massive number of applications, but you are able to accommodate only a small percentage of the applicant pool. How might you decide who should be admitted? You might try to correlate your current students' college GPA with their scores on standardized tests like the SAT or ACT. By observing which correlations were strongest for your current students, you could use this information to predict the relative success of those students who have applied for admission into the university.

Correlation Does Not Indicate Causation

Correlational research is useful because it allows us to discover the strength and direction of relationships that exist between two variables. However, correlation is limited because establishing the existence of a relationship tells us little about **cause and effect**. While variables are sometimes correlated because one does cause the other, it could also be that some other factor, a **confounding variable**, is actually causing the systematic movement in our variables of interest. In the ice cream/crime rate example mentioned earlier, temperature is a confounding variable that could account for the relationship between the two variables.

Even when we cannot point to clear confounding variables, we should not assume that a correlation between two variables implies that one variable causes changes in another. This can be frustrating when a cause-and-effect relationship seems clear and intuitive. Think back to our discussion of the research done by the American Cancer Society and how their research projects were some of the first demonstrations of the link between smoking and cancer. It seems reasonable to assume that smoking causes cancer, but if we were limited to correlational research, we would be overstepping our bounds by making this assumption.

Unfortunately, people mistakenly make claims of causation as a

function of correlations all the time. Such claims are especially common in advertisements and news stories. For example, recent research found that people who eat cereal on a regular basis achieve healthier weights than those who rarely eat cereal (Frantzen, Treviño, Echon, Garcia-Dominic, & DiMarco, 2013; Barton et al., 2005). Guess how the cereal companies report this finding. Does eating cereal really cause an individual to maintain a healthy weight, or are there other possible explanations, such as, someone at a healthy weight is more likely to regularly eat a healthy breakfast than someone who is obese or someone who avoids meals in an attempt to diet? While correlational research is invaluable in identifying relationships among variables, a significant limitation is the inability to establish causality. Psychologists want to make statements about cause and effect, but the only way to do that is to conduct an experiment to answer a research question. The next section describes how scientific experiments incorporate methods that eliminate or control for alternative explanations, which allow researchers to explore how changes in one variable cause changes in another variable.

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Video 2. *Correlation and Causality* provides explanation for why correlation does not imply causality.

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Illusory Correlations

The temptation to make erroneous cause-and-effect statements based on correlational research is not the only way we tend to misinterpret data. We also tend to make the mistake of illusory correlations, especially with unsystematic observations. **Illusory correlations**, or false correlations, occur when people believe that relationships exist between two things when no such relationship exists. One well-known illusory correlation is the supposed effect that the moon's phases have on human behavior. Many people passionately assert that human behavior is affected by the phase of the moon, and specifically, that people act strangely when the moon is full (Figure 2).

***Figure 2**. Many people believe that a full moon makes people behave oddly. (credit: Cory Zanker)*

There is no denying that the moon exerts a powerful influence on our planet. The ebb and flow of the ocean's tides are tightly tied to the gravitational forces of the moon. Many people believe, therefore, that it is logical that we are affected by the moon as well. After all, our bodies are

largely made up of water. A meta-analysis of nearly 40 studies consistently demonstrated, however, that the relationship between the moon and our behavior does not exist (Rotton & Kelly, 1985). While we may pay more attention to odd behavior during the full phase of the moon, the rates of odd behavior remain constant throughout the lunar cycle. Why are we so apt to believe in illusory correlations like this? Often we read or hear about them and simply accept the information as valid. Or, we have a hunch about how something works and then look for evidence to support that hunch, ignoring evidence that would tell us our hunch is false; this is known as **confirmation bias**. Other times, we find illusory correlations based on the information that comes most easily to mind, even if that information is severely limited. And while we may feel confident that we can use these relationships to better understand and predict the world around us, illusory correlations can have significant drawbacks. For example, research suggests that illusory correlations—in which certain behaviors are inaccurately attributed to certain groups—are involved in the formation of prejudicial attitudes that can ultimately lead to discriminatory behavior (Fiedler, 2004).

Experimental Research

As you've learned, the only way to establish that there is a cause-and-effect relationship between two variables is to conduct a scientific experiment. Experiment has a different meaning in the scientific context than in everyday life. In everyday conversation, we often use it to describe trying something for the first time, such as experimenting with a new hairstyle or new food. However, in the scientific context, an experiment has precise requirements for design and implementation.

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Video 1. *Experimental Research Design* provides explanation and examples for correlational research. A closed-captioned version of this video is available here.

The Experimental Hypothesis

In order to conduct an experiment, a researcher must have a specific hypothesis to be tested. As you've learned, hypotheses can be formulated either through direct observation of the real world or after careful review of previous research. For example, if you think that children should not be allowed to watch violent programming on television because doing so would cause them to behave more

violently, then you have basically formulated a hypothesis—namely, that watching violent television programs causes children to behave more violently. How might you have arrived at this particular hypothesis? You may have younger relatives who watch cartoons featuring characters using martial arts to save the world from evildoers, with an impressive array of punching, kicking, and defensive postures. You notice that after watching these programs for a while, your young relatives mimic the fighting behavior of the characters portrayed in the cartoon. Seeing behavior like this right after a child watches violent television programming might lead you to hypothesize that viewing violent television programming leads to an increase in the display of violent behaviors. These sorts of personal observations are what often lead us to formulate a specific hypothesis, but we cannot use limited personal observations and anecdotal evidence to test our hypothesis rigorously. Instead, to find out if real-world data supports our hypothesis, we have to conduct an experiment.

Designing an Experiment

The most basic experimental design involves two groups: the experimental group and the control group. The two groups are designed to be the same except for one difference— experimental manipulation. The **experimental group** gets the experimental manipulation—that is, the treatment or variable being tested (in this case, violent TV images)—and the **control group** does not. Since experimental manipulation is the only difference between the experimental and control groups, we can be sure that any differences between the two are due to experimental manipulation rather than chance.

In our example of how violent television programming might affect violent behavior in children, we have the experimental group view violent television programming for a specified time and then

measure their violent behavior. We measure the violent behavior in our control group after they watch nonviolent television programming for the same amount of time. It is important for the control group to be treated similarly to the experimental group, with the exception that the control group does not receive the experimental manipulation. Therefore, we have the control group watch non-violent television programming for the same amount of time as the experimental group.

We also need to define precisely, or operationalize, what is considered violent and nonviolent. An **operational definition** is a description of how we will measure our variables, and it is important in allowing others to understand exactly how and what a researcher measures in a particular experiment. In operationalizing violent behavior, we might choose to count only physical acts like kicking or punching as instances of this behavior, or we also may choose to include angry verbal exchanges. Whatever we determine, it is important that we operationalize violent behavior in such a way that anyone who hears about our study for the first time knows exactly what we mean by violence. This aids peoples' ability to interpret our data as well as their capacity to repeat our experiment should they choose to do so.

Once we have operationalized what is considered violent television programming and what is considered violent behavior from our experiment participants, we need to establish how we will run our experiment. In this case, we might have participants watch a 30-minute television program (either violent or nonviolent, depending on their group membership) before sending them out to a playground for an hour where their behavior is observed and the number and type of violent acts are recorded.

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Ideally, the people who observe and record the children's behavior are unaware of who was assigned to the experimental or control group, in order to control for experimenter bias. **Experimenter bias** refers to the possibility that a researcher's expectations might skew the results of the study. Remember, conducting an experiment requires a lot of planning, and the people involved in the research project have a vested interest in supporting their hypotheses. If the observers knew which child was in which group, it might influence how much attention they paid to each child's behavior as well as how they interpreted that behavior. By being blind to which child is in which group, we protect against those biases. This situation is a **single-blind study**, meaning that the participants are unaware as to which group they are in (experiment or control group) while the researcher knows which participants are in each group.

In a **double-blind study**, both the researchers and the participants are blind to group assignments. Why would a researcher want to run a study where no one knows who is in which group? Because by doing so, we can control for both experimenter and participant expectations. If you are familiar with the phrase **placebo effect**, you already have some idea as to why this is an important consideration. The placebo effect occurs when people's expectations or beliefs influence or determine their experience in a given situation. In other words, simply expecting something to happen can actually make it happen.

The placebo effect is commonly described in terms of testing the effectiveness of a new medication. Imagine that you work in a pharmaceutical company, and you think you have a new drug that is effective in treating depression. To demonstrate that your medication is effective, you run an experiment with two groups: The experimental group receives the medication, and the control group does not. But you don't want participants to know whether they received the drug or not.

Why is that? Imagine that you are a participant in this study, and you have just taken a pill that you think will improve your mood. Because you expect the pill to have an effect, you might feel better simply because you took the pill and not because of any drug actually contained in the pill—this is the placebo effect.

To make sure that any effects on mood are due to the drug and not due to expectations, the control group receives a placebo (in this case, a sugar pill). Now everyone gets a pill, and once again, neither the researcher nor the experimental participants know who got the drug and who got the sugar pill. Any differences in mood between the experimental and control groups can now be attributed to the drug itself rather than to experimenter bias or participant expectations.

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Video 2. *Introduction to Experimental Design* introduces fundamental elements for experimental research design.

Independent and Dependent Variables

In a research experiment, we strive to study whether changes in one thing cause changes in another. To achieve this, we must pay attention to two important variables, or things that can be changed, in any experimental study: the independent variable and the dependent variable. An **independent variable** is manipulated or controlled by the experimenter. In a well-designed experimental study, the independent variable is the only important difference between the experimental and control groups. In our example of how violent television programs affect children's display of violent behavior, the independent variable is the type of program—violent or nonviolent—viewed by participants in the study (Figure 2.3). A **dependent variable** is what the researcher measures to see how much effect the independent variable had. In our example, the dependent variable is the number of violent acts displayed by the experimental participants.

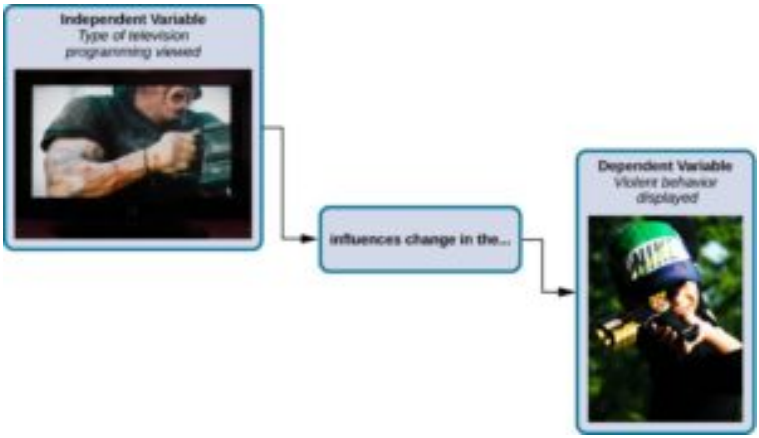

Figure 1. In an experiment, manipulations of the independent variable are expected to result in changes in the dependent variable.

We expect that the dependent variable will change as a function of the independent variable. In other words, the dependent variable *depends* on the independent variable. A good way to think about the relationship between the independent and dependent variables is with this question: What effect does the independent variable have on the dependent variable? Returning to our example, what effect does watching a half-hour of violent television programming or nonviolent television programming have on the number of incidents of physical aggression displayed on the playground?

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Selecting and Assigning Experimental Participants

Now that our study is designed, we need to obtain a sample of individuals to include in our experiment. Our study involves human participants, so we need to determine who to include. **Participants** are the subjects of psychological research, and as the name implies, individuals who are involved in psychological research actively participate in the process. Often, psychological research projects rely on college students to serve

as participants. In fact, the vast majority of research in psychology subfields has historically involved students as research participants (Sears, 1986; Arnett, 2008). But are college students truly representative of the general population? College students tend to be younger, more educated, more liberal, and less diverse than the general population. Although using students as test subjects is an accepted practice, relying on such a limited pool of research participants can be problematic because it is difficult to generalize findings to the larger population.

Our hypothetical experiment involves children, and we must first generate a sample of child participants. Samples are used because populations are usually too large to reasonably involve every member in our particular experiment (Figure 2.4). If possible, we should use a random sample (there are other types of samples, but for the purposes of this chapter, we will focus on random samples). A **random sample** is a subset of a larger population in which every member of the population has an equal chance of being selected. Random samples are preferred because if the sample is large enough we can be reasonably sure that the participating individuals are representative of the larger population. This means that the percentages of characteristics in the sample—sex, ethnicity, socioeconomic level, and any other characteristics that might affect the results—are close to those percentages in the larger population.

In our example, let's say we decide our population of interest is fourth graders. But all fourth graders is a very large population, so we need to be more specific; instead, we might say our population of interest is all fourth graders in a particular city. We should include students from various income brackets, family situations, races, ethnicities, religions, and geographic areas of town. With this more manageable population, we can work with the local schools in selecting a random sample of around 200 fourth-graders that we want to participate in our experiment.

In summary, because we cannot test all of the fourth graders in a city, we want to find a group of about 200 that reflects the composition of that city. With a representative group, we can

generalize our findings to the larger population without fear of our sample being biased in some way.

Figure 2. Researchers may work with (a) a large population or (b) a sample group that is a subset of the larger population.

Now that we have a sample, the next step of the experimental process is to split the participants into experimental and control groups through random assignment. With **random assignment**, all participants have an equal chance of being assigned to either group. There is statistical software that will randomly assign each of the fourth graders in the sample to either the experimental or the control group.

Random assignment is critical for sound experimental design. With sufficiently large samples, random assignment makes it unlikely that there are systematic differences between the groups. So, for instance, it would be improbable that we would get one group composed entirely of males, a given ethnic identity, or a given religious ideology. This is important because if the groups were systematically different before the experiment began, we would not know the origin of any differences we find between the groups: Were the differences preexisting, or were they caused by manipulation of the independent variable? Random assignment allows us to assume that any differences observed between experimental and control groups result from the manipulation of the independent variable.

Exercises

Use this online tool to generate randomized numbers instantly and to learn more about random sampling and assignments.

Issues to Consider

While experiments allow scientists to make cause-and-effect claims, they are not without problems. True experiments require the experimenter to manipulate an independent variable, and that can complicate many questions that psychologists might want to address. For instance, imagine that you want to know what effect sex (the independent variable) has on spatial memory (the dependent variable). Although you can certainly look for differences between males and females on a task that taps into spatial memory, you cannot directly control a person's sex. We categorize this type of research approach as quasi-experimental and recognize that we cannot make cause-and-effect claims in these circumstances.

Experimenters are also limited by ethical constraints. For instance, you would not be able to conduct an experiment designed to determine if experiencing abuse as a child leads to lower levels of self-esteem among adults. To conduct such an experiment, you would need to randomly assign some experimental participants to a group that receives abuse, and that experiment would be unethical.

Interpreting Experimental Findings

Once data is collected from both the experimental and the control groups, a **statistical analysis** is conducted to find out if there are meaningful differences between the two groups. The statistical analysis determines how likely any difference found is due to chance (and thus not meaningful). In psychology, group differences are considered meaningful, or significant, if the odds that these differences occurred by chance alone are 5 percent or less. Stated another way, if we repeated this experiment 100 times, we would expect to find the same results at least 95 times out of 100.

The greatest strength of experiments is the ability to assert that any significant differences in the findings are caused by the independent variable. This occurs because random selection, random assignment, and a design that limits the effects of both experimenter bias and participant expectancy should create groups that are similar in composition and treatment. Therefore, any difference between the groups is attributable to the independent variable, and now we can finally make a causal statement. If we find that watching a violent television program results in more violent behavior than watching a nonviolent program, we can safely say that watching violent television programs causes an increase in the display of violent behavior.

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Developmental Research Designs

Sometimes, especially in developmental research, the researcher is interested in examining changes over time and will need to consider a research design that will capture these changes. Remember, *research methods* are tools that are used to collect information, while r**esearch design** is the strategy or blueprint for deciding how to collect and analyze information. Research design dictates which methods are used and how. There are three types of developmental research designs: cross-sectional, longitudinal, and sequential.

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Video 1. *Developmental Research Design* summarizes the benefits of challenges of the three developmental design models.

Cross-Sectional Designs

The majority of developmental studies use cross-sectional designs because they are less time-consuming and less expensive than other developmental designs. **Cross-sectional research** designs are used to examine behavior in participants of different ages who are

tested at the same point in time. Let's suppose that researchers are interested in the relationship between intelligence and aging. They might have a hypothesis that intelligence declines as people get older. The researchers might choose to give a particular intelligence test to individuals who are 20 years old, individuals who are 50 years old, and individuals who are 80 years old at the same time and compare the data from each age group. This research is cross-sectional in design because the researchers plan to examine the intelligence scores of individuals of different ages within the same study at the same time; they are taking a "cross-section" of people at one point in time. Let's say that the comparisons find that the 80-year-old adults score lower on the intelligence test than the 50-year-old adults, and the 50-year-old adults score lower on the intelligence test than the 20-year-old adults. Based on these data, the researchers might conclude that individuals become less intelligent as they get older. Would that be a valid (accurate) interpretation of the results?

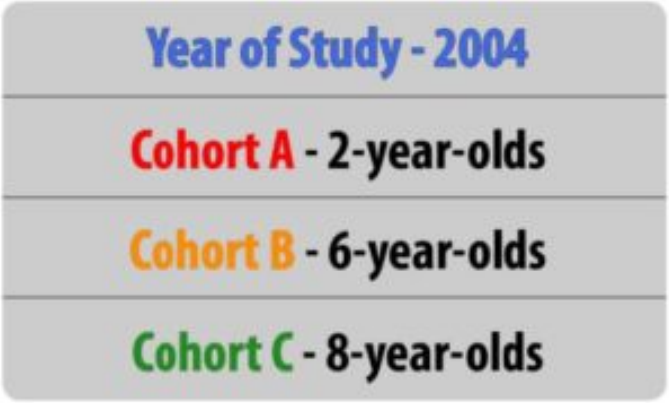

Figure 1. Example of cross-sectional research design

No, that would not be a valid conclusion because the researchers did not follow individuals as they aged from 20 to 50 to 80 years old. One of the primary limitations of cross-sectional research is

that the results yield information about age *differences* not necessarily *changes* over time. That is, although the study described above can show that the 80-year-olds scored lower on the intelligence test than the 50-year-olds, and the 50-year-olds scored lower than the 20-year-olds, the data used for this conclusion were collected from different individuals (or groups). It could be, for instance, that when these 20-year-olds get older, they will still score just as high on the intelligence test as they did at age 20. Similarly, maybe the 80-year-olds would have scored relatively low on the intelligence test when they were young; the researchers don't know for certain because they did not follow the same individuals as they got older.

With each cohort being members of a different generation, it is also possible that the differences found between the groups are not due to age, per se, but due to cohort effects. Differences between these cohorts' IQ results could be due to differences in life experiences specific to their generation, such as differences in education, economic conditions, advances in technology, or changes in health and nutrition standards, and not due to age-related changes.

Another disadvantage of cross-sectional research is that it is limited to one time of measurement. Data are collected at one point in time, and it's possible that something could have happened in that year in history that affected all of the participants, although possibly each cohort may have been affected differently.

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Longitudinal Research Designs

Longitudinal research involves beginning with a group of people who may be of the same age and background (cohort) and measuring them repeatedly over a long period of time. One of the benefits of this type of research is that people can be followed through time and be compared with themselves when they were younger; therefore, changes with age over time are measured. What would be the advantages and disadvantages of longitudinal research? Problems with this type of research include being expensive, taking a long time, and subjects dropping out over time.

Longitudinal research designs are used to examine behavior in the same individuals over time. For instance, with our example of studying intelligence and aging, a researcher might conduct a longitudinal study to examine whether 20-year-olds become less intelligent with age over time. To this end, a researcher might give an intelligence test to individuals when they are 20 years old, again when they are 50 years old, and then again when they are 80 years old. This study is longitudinal in nature because the researcher plans to study the same individuals as they age. Based on these data, the pattern of intelligence and age might look different than from the cross-sectional research; it might be found that participants' intelligence scores are higher at age 50 than at age 20 and then remain stable or decline a little by age 80. How can that be when cross-sectional research revealed declines in intelligence with age?

Figure 2. Example of a longitudinal research design

Since longitudinal research happens over a period of time (which could be short-term, as in months, but is often longer, as in years), there is a risk of attrition. **Attrition** occurs when participants fail to complete all portions of a study. Participants may move, change their phone numbers, die, or simply become disinterested in participating over time. Researchers should account for the possibility of attrition by enrolling a larger sample into their study initially, as some participants will likely drop out over time. There is also something known as **selective attrition—**this means that certain groups of individuals may tend to drop out. It is often the least healthy, least educated, and lower socioeconomic participants who tend to drop out over time. That means that the remaining participants may no longer be representative of the whole population, as they are, in general, healthier, better educated, and have more money. This could be a factor in why our hypothetical research found a more optimistic picture of intelligence and aging as the years went by. What can researchers do about selective attrition? At each time of testing, they could randomly recruit more participants from the same cohort as the original members to replace those who have dropped out.

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The results from longitudinal studies may also be impacted by repeated assessments. Consider how well you would do on a math test if you were given the exact same exam every day for a week. Your performance would likely improve over time, not necessarily

because you developed better math abilities, but because you were continuously practicing the same math problems. This phenomenon is known as a practice effect. Practice effects occur when participants become better at a task over time because they have done it again and again (not due to natural psychological development). So our participants may have become familiar with the intelligence test each time (and with the computerized testing administration).

Another limitation of longitudinal research is that the data are limited to only one cohort. As an example, think about how comfortable the participants in the 2010 cohort of 20-year-olds are with computers. Since only one cohort is being studied, there is no way to know if findings would be different from other cohorts. In addition, changes that are found as individuals age over time could be due to age or to time of measurement effects. That is, the participants are tested at different periods in history, so the variables of age and time of measurement could be confounded (mixed up). For example, what if there is a major shift in workplace training and education between 2020 and 2040, and many of the participants experience a lot more formal education in adulthood, which positively impacts their intelligence scores in 2040? Researchers wouldn't know if the intelligence scores increased due to growing older or due to a more educated workforce over time between measurements.

Sequential Research Designs

Sequential research designs include elements of both longitudinal and cross-sectional research designs. Similar to longitudinal designs, sequential research features participants who are followed over time; similar to cross-sectional designs, sequential research includes participants of different ages. This research design is also distinct from those that have been discussed previously in

that individuals of different ages are enrolled into a study at various points in time to examine age-related changes, development within the same individuals as they age, and to account for the possibility of cohort and/or time of measurement effects

Consider, once again, our example of intelligence and aging. In a study with a sequential design, a researcher might recruit three separate groups of participants (Groups A, B, and C). Group A would be recruited when they are 20 years old in 2010 and would be tested again when they are 50 and 80 years old in 2040 and 2070, respectively (similar in design to the longitudinal study described previously). Group B would be recruited when they are 20 years old in 2040 and would be tested again when they are 50 years old in 2070. Group C would be recruited when they are 20 years old in 2070, and so on.

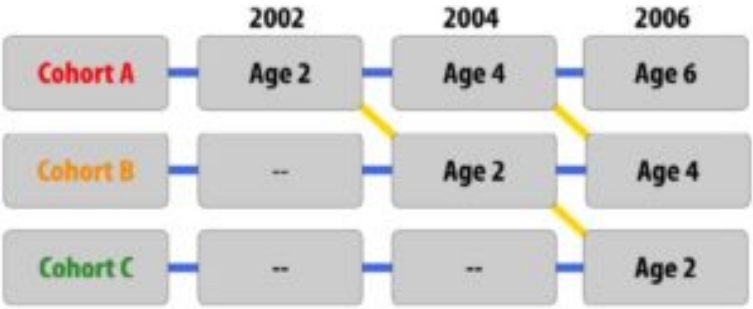

Figure 3. Example of sequential research design

Studies with sequential designs are powerful because they allow for both longitudinal and cross-sectional comparisons—changes and/or stability with age over time can be measured and compared with differences between age and cohort groups. This research design also allows for the examination of cohort and time of measurement effects. For example, the researcher could examine the intelligence scores of 20-year-olds at different times in history and different cohorts (follow the yellow diagonal lines in figure 3). This might be examined by researchers who are interested in

sociocultural and historical changes (because we know that lifespan development is multidisciplinary). One way of looking at the usefulness of the various developmental research designs was described by Schaie and Baltes (1975): cross-sectional and longitudinal designs might reveal change patterns while sequential designs might identify developmental origins for the observed change patterns.

Since they include elements of longitudinal and cross-sectional designs, sequential research has many of the same strengths and limitations as these other approaches. For example, sequential work may require less time and effort than longitudinal research (if data are collected more frequently than over the 30-year spans in our example) but more time and effort than cross-sectional research. Although practice effects may be an issue if participants are asked to complete the same tasks or assessments over time, attrition may be less problematic than what is commonly experienced in longitudinal research since participants may not have to remain involved in the study for such a long period of time.

Comparing Developmental Research Designs

When considering the best research design to use in their research, scientists think about their main research question and the best way to come up with an answer. A table of advantages and disadvantages for each of the described research designs is provided here to help you as you consider what sorts of studies would be best conducted using each of these different approaches.

Table 1. Advantages and disadvantages of different research designs

	Advantages	Disadvantages
Cross-Sectional	• Examines changes between participants of different ages at the same point in time • Provides information on age differences	• Cannot examine change over time • Limited to one time in history • Cohort differences confounded with age differences
Longitudinal	• Examines changes within individuals over time • Provides a developmental analysis	• Expensive • Takes a long time • Participant attrition • Possibility of practice effects • Limited to one cohort • Time in history effects confounded with age changes
Sequential	• Examines changes within individuals over time • Examines changes between participants of different ages at the same point in time • Can be used to examine cohort effects • Can be used to examine time in history effects	• May be expensive • May take a long time • Possibility of practice effects • Some participant attrition

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Challenges Conducting Developmental Research

The previous sections describe research tools to assess development across the lifespan, as well as the ways that research designs can be used to track age-related changes and development over time. Before you begin conducting developmental research, however, you must also be aware that testing individuals of certain ages (such as infants and children) or making comparisons across ages (such as children compared to teens) comes with its own unique set of challenges. In the final section of this module, let's look at some of the main issues that are encountered when conducting developmental research, namely ethical concerns, recruitment issues, and participant attrition.

Ethical Concerns

As a student of the social sciences, you may already know that **Institutional Review Boards (IRBs)** must review and approve all research projects that are conducted at universities, hospitals, and other institutions (each broad discipline or field, such as psychology or social work, often has its own code of ethics that must also be followed, regardless of institutional affiliation). An IRB is typically a panel of experts who read and evaluate proposals for research. IRB members want to ensure that the proposed research will be carried out ethically and that the potential benefits of the research outweigh the risks and potential harm (psychological as well as physical harm) for participants.

What you may not know though, is that the IRB considers some groups of participants to be more vulnerable or at-risk than others.

Whereas university students are generally not viewed as vulnerable or at-risk, infants and young children commonly fall into this category. What makes infants and young children more vulnerable during research than young adults? One reason infants and young children are perceived as being at increased risk is due to their limited cognitive capabilities, which makes them unable to state their willingness to participate in research or tell researchers when they would like to drop out of a study. For these reasons, infants and young children require special accommodations as they participate in the research process. Similar issues and accommodations would apply to adults who are deemed to be of limited cognitive capabilities.

When thinking about special accommodations in developmental research, consider the **informed consent** process. If you have ever participated in scientific research, you may know through your own experience that adults commonly sign an informed consent statement (a contract stating that they agree to participate in research) after learning about a study. As part of this process, participants are informed of the procedures to be used in the research, along with any expected risks or benefits. Infants and young children cannot verbally indicate their willingness to participate, much less understand the balance of potential risks and benefits. As such, researchers are oftentimes required to obtain written informed consent from the parent or legal guardian of the child participant, an adult who is almost always present as the study is conducted. In fact, children are not asked to indicate whether they would like to be involved in a study at all (a process known as assent) until they are approximately seven years old. Because infants and young children cannot easily indicate if they would like to discontinue their participation in a study, researchers must be sensitive to changes in the state of the participant (determining whether a child is too tired or upset to continue) as well as to parent desires (in some cases, parents might want to discontinue their involvement in the research). As in adult studies, researchers must always strive to protect the rights and well-being of the minor

participants and their parents when conducting developmental research.

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Video 2.10.1. *How IRBs Protect Human Research Participants* explains the purpose of IRBs in assuring the health and safety of participants in research.

Recruitment

An additional challenge in developmental science is participant recruitment. Recruiting university students to participate in adult studies is typically easy. Many colleges and universities offer extra credit for participation in research and have locations such as bulletin boards and school newspapers where research can be advertised. Unfortunately, young children cannot be recruited by making announcements in Introduction to Psychology courses, by posting ads on campuses, or through online platforms such as Amazon Mechanical Turk. Given these limitations, how do researchers go about finding infants and young children to be in their studies?

The answer to this question varies along multiple dimensions. Researchers must consider the number of participants they need and the financial resources available to them, among other things. Location may also be an important consideration. Researchers who

need large numbers of infants and children may attempt to recruit them by obtaining infant birth records from the state, county, or province in which they reside. Some areas make this information publicly available for free, whereas birth records must be purchased in other areas (and in some locations birth records may be entirely unavailable as a recruitment tool). If birth records are available, researchers can use the obtained information to call families by phone or mail them letters describing possible research opportunities. All is not lost if this recruitment strategy is unavailable, however. Researchers can choose to pay a recruitment agency to contact and recruit families for them. Although these methods tend to be quick and effective, they can also be quite expensive. More economical recruitment options include posting advertisements and fliers in locations frequented by families, such as mommy-and-me classes, local malls, and preschools or daycare centers. Researchers can also utilize online social media outlets like Facebook, which allows users to post recruitment advertisements for a small fee. Of course, each of these different recruitment techniques requires IRB approval. And if children are recruited and/or tested in school settings, permission would need to be obtained ahead of time from teachers, schools, and school districts (as well as informed consent from parents or guardians).

And what about the recruitment of adults? While it is easy to recruit young college students to participate in research, some would argue that it is too easy and that college students are samples of convenience. They are not randomly selected from the wider population, and they may not represent all young adults in our society (this was particularly true in the past with certain cohorts, as college students tended to be mainly white males of high socioeconomic status). In fact, in the early research on aging, this type of convenience sample was compared with another type of convenience sample—young college students tended to be compared with residents of nursing homes! Fortunately, it didn't take long for researchers to realize that older adults in nursing homes are not representative of the older population; they tend to

be the oldest and sickest (physically and/or psychologically). Those initial studies probably painted an overly negative view of aging, as young adults in college were being compared to older adults who were not healthy, had not been in school nor taken tests in many decades, and probably did not graduate high school, let alone college. As we can see, recruitment and random sampling can be significant issues in research with adults, as well as infants and children. For instance, how and where would you recruit middle-aged adults to participate in your research?

Attrition

Figure 2.10.1. *Participating in developmental research can be difficult for both children and their parents. This can contribute to a higher attrition rate than is typical in other types of research.*

Another important consideration when conducting research with infants and young children is **attrition**. Although attrition is quite common in longitudinal research in particular (see the previous section on longitudinal designs for an example of high attrition rates and selective attrition in lifespan developmental research), it is also problematic in developmental science more generally, as studies with infants and young children tend to have higher attrition rates than studies with adults. For example, high attrition rates in ERP (event-related potential, which is a technique to understand brain function) studies oftentimes result from the demands of the task: infants are required to sit still and have a tight, wet cap placed on their heads before watching still

photographs on a computer screen in a dark, quiet room. In other cases, attrition may be due to motivation (or a lack thereof). Whereas adults may be motivated to participate in research in order to receive money or extra course credit, infants and young children are not as easily enticed. In addition, infants and young children are more likely to tire easily, become fussy, and lose interest in the study procedures than are adults. For these reasons, research studies should be designed to be as short as possible – it is likely better to break up a large study into multiple short sessions rather than cram all of the tasks into one long visit to the lab. Researchers should also allow time for breaks in their study protocols so that infants can rest or have snacks as needed. Happy, comfortable participants provide the best data.

Conclusions

Lifespan development is a fascinating field of study – but care must be taken to ensure that researchers use appropriate methods to examine human behavior, use the correct experimental design to answer their questions, and be aware of the special challenges that are part-and-parcel of developmental research. After reading this module, you should have a solid understanding of these various issues and be ready to think more critically about research questions that interest you. For example, what types of questions do you have about lifespan development? What types of research would you like to conduct? Many interesting questions remain to be examined by future generations of developmental scientists – maybe you will make one of the next big discoveries!

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Glossary

attrition: reduction in the number of research participants as some drop out over time

case study: exploring a single case or situation in great detail. Information may be gathered with the use of observation, interviews, testing, or other methods to uncover as much as possible about a person or situation

cohort: a group of people who are born at roughly the same period in a particular society. Cohorts share histories and contexts for living

content analysis: involves looking at media such as old texts, pictures, commercials, lyrics or other materials to explore patterns or themes in culture

control group: a comparison group that is equivalent to the experimental group, but is not given the independent variable

correlation: the relationship between two or more variables; when two variables are correlated, one variable changes as the other does

correlation coefficient: number from -1 to +1, indicating the strength and direction of the relationship between variables, and usually represented by r

correlational research: research that formally tests whether a relationship exists between two or more variables, however, correlation does not imply causation

cross-sectional research: used to examine behavior in participants of different ages who are tested at the same point in time; may confound age and cohort differences

dependent variable: the outcome or variable that is supposedly affected by the independent variable

descriptive studies: research focused on describing an occurrence

double-blind: a research design in which neither the participants

nor the researchers know whether an individual is assigned to the experimental group or the control group

experimental group: the group of participants in an experiment who receive the independent variable

experimental research: research that involves randomly assigning people to different conditions and using hypothesis testing to make inferences about how these conditions affect behavior; the only method that measures cause and effect between variables

experiments: designed to test hypotheses in a controlled setting in efforts to explain how certain factors or events produce outcomes; the only research method that measures cause and effect relationships between variables

explanatory studies: research that tries to answer the question "why"

Hawthorne effect: individuals tend to change their behavior when they know they are being watched

hypotheses: specific statements or predictions about the relationship between variables

independent variable: something that is manipulated or introduced by the researcher to the experimental group; treatment or intervention

longitudinal research: studying a group of people who may be of the same age and background (cohort), and measuring them repeatedly over a long period of time; may confound age and time of measurement effects

negative correlation: two variables change in different directions, with one becoming larger as the other becomes smaller; a negative correlation is not the same thing as no correlation

observational studies: also called naturalistic observation, involves watching and recording the actions of participants

operationalized: concepts transformed into variables that can be measured in research

positive correlation: two variables change in the same direction, both becoming either larger or smaller

qualitative research: theoretical ideas are "grounded" in the experiences of the participants, who answer open-ended questions

quantitative research: involves numerical data that are quantified using statistics to understand and report what has been studied

reliability: when something yields consistent results

research design: the strategy or blueprint for deciding how to collect and analyze information; dictates which methods are used and how

scatterplot: a plot or mathematical diagram consisting of data points that represent two variables

secondary content analysis: archival research, involves analyzing information that has already been collected or examining documents or media to uncover attitudes, practices, or preferences

selective attrition: certain groups of individuals may tend to drop out more frequently resulting in the remaining participants longer being representative of the whole population

sequential research design: combines aspects of cross-sectional and longitudinal designs, but also adding new cohorts at different times of measurement; allows for analyses to consider effects of age, cohort, time of measurement, and socio-historical change

survey: asking a standard set of questions to a group of subjects

validity: when something yields accurate results

variables: factors that change in value

DEVELOPMENTAL THEORIES

Learning Objectives

- Describe theories as they relate to lifespan development
- Describe the historical foundations leading to the development of theories about lifespan development
- Describe Freud's theory of psychosexual development
- Describe Erikson's eight stages of psychosocial development
- Describe the principles of classical conditioning
- Describe the principles of operant conditioning
- Describe social learning theory
- Describe Piaget's theory of cognitive development
- Describe information processing approaches to cognitive development
- Describe the major concepts of humanistic theory (unconditional positive regard, the good life), as developed by Carl Rogers
- Explain Maslow's hierarchy of needs
- Describe Vygotsky's sociocultural theory of cognitive development
- Explain Bronfenbrenner's bioecological model
- Describe the evolutionary perspective
- Contrast the main psychological theories that apply

to human development

Figure 3.1.1*. Child labor in Indiana glassworks. (Hine, 1908) Society's view of childhood has changed through the ages. Many children in the early 1900's worked full time in mines.*

Childhood as a concept first emerged around the 17th century. In 1960, Philippe Ariès wrote a book called *L'Enfant et la Vie Familiale sous l'Ancien Régime* (1960), which was translated into English as *Centuries of Childhood* (1962). The book was significant both in that it recognized childhood as a social construction rather than as a biological given and in so doing, it founded the history of childhood as a serious field of study.

Ariès argued that childhood was not understood as a separate stage of life until the 15th century, and children were seen as little adults who shared the same traditions, games, and clothes. He said that parenting during the Middle Ages was largely detached, and

there were not nuclear family bonds of love and concern. His account of childhood has since been widely criticized, but even today, Ariès remains the standard reference to the topic. He is most famous for his statement that "in medieval society, the idea of childhood did not exist".

Attitudes towards children have evolved over time along with economic change and social advancement. Before the 17th century, children were generally considered weaker, more insignificant versions of adults. They were assumed to be subject to the same needs and desires as adults and to have the same vices and virtues as adults. Therefore they dressed the same, were not warranted more privileges, and they worked the same hours and received the same punishments for misdeeds. If they stole, they were hanged. If they worked hard and did well, they could achieve prosperity. Children were considered adults as soon as they could live alone.

At the time, this was society's view of lifespan development. The only difference between children and adults was size. We now reject this medieval view, but how do we go about formulating contemporary theories? Our own personal theories about development are based on experiences, folklore, stories in the media, or built haphazardly on unverified observation. However, theories presented in this course are more formal. They are based on prior findings and observations by psychologists and other researchers and provide a framework through which we can draw conclusions and make predictions about human behavior. These theories are subject to rigorous testing through research and are based on a psychological approach. A **psychological approach** is a perspective, based on certain assumptions, about behavior. Each approach holds shared ideas about how to describe, predict, and explain behavior.

In this chapter, we will discuss the major psychological approaches that pertain to development. But first, we will briefly review some of the early founders of the field of developmental psychology. We will then examine the major characteristics of the

contemporary approaches: psychodynamic, behavioral, humanistic, cognitive, contextual, biological, and evolutionary psychology.

Understanding Theories

Scientific knowledge is advanced through a process known as the scientific method. Basically, ideas (in the form of theories and hypotheses) are tested against the real world (in the form of empirical observations), and those empirical observations lead to more ideas that are tested against the real world, and so on. In this sense, the scientific process is circular. The types of reasoning within the circle are called deductive and inductive. In **deductive reasoning**, ideas are tested against the empirical world; in **inductive reasoning**, empirical observations lead to new ideas (Figure 2.4). These processes are inseparable, like inhaling and exhaling, but different research approaches place different emphasis on the deductive and inductive aspects.

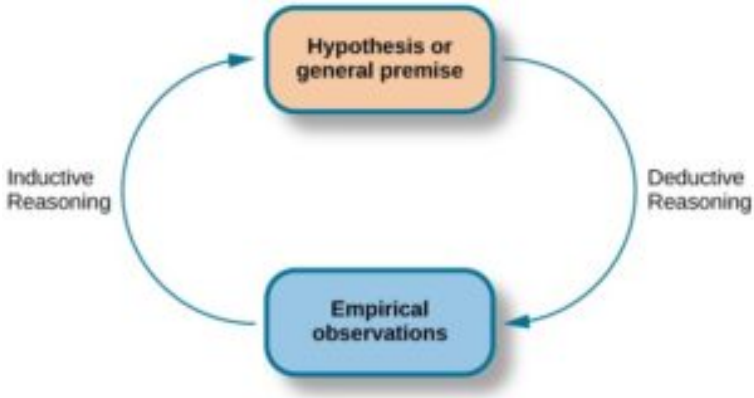

Figure 1. Psychological research relies on both inductive and deductive reasoning.

In the scientific context, deductive reasoning begins with a generalization—one hypothesis—that is then used to reach logical conclusions about the real world. If the hypothesis is correct, then

the logical conclusions reached through deductive reasoning should also be correct. A deductive reasoning argument might go something like this: All living things require energy to survive (this would be your hypothesis). Ducks are living things. Therefore, ducks require energy to survive (logical conclusion). In this example, the hypothesis is correct; therefore, the conclusion is correct as well. Sometimes, however, an incorrect hypothesis may lead to a logical but incorrect conclusion. Consider this argument: all ducks are born with the ability to see. Quackers is a duck. Therefore, Quackers was born with the ability to see. Scientists use deductive reasoning to test their hypotheses empirically. Returning to the example of the ducks, researchers might design a study to test the hypothesis that if all living things require energy to survive, then ducks will be found to require energy to survive.

Deductive reasoning starts with a generalization that is tested against real-world observations; however, inductive reasoning moves in the opposite direction. Inductive reasoning uses empirical observations to construct broad generalizations. Unlike deductive reasoning, conclusions drawn from inductive reasoning may or may not be correct, regardless of the observations on which they are based. For instance, you may notice that your favorite fruits—apples, bananas, and oranges—all grow on trees; therefore, you assume that all fruit must grow on trees. This would be an example of inductive reasoning, and the existence of strawberries, blueberries, and kiwi demonstrate that this generalization is not correct despite it being based on several direct observations. Scientists use inductive reasoning to formulate theories, which in turn generate hypotheses that are tested with deductive reasoning. In the end, science involves both deductive and inductive processes.

For example, case studies are heavily weighted on the side of empirical observations. Thus, case studies are closely associated with inductive processes as researchers gather massive amounts of observations and seek interesting patterns (new ideas) in the data. Experimental research, on the other hand, puts great emphasis on deductive reasoning.

What is a Theory?

We have stated that theories and hypotheses are ideas, but what sort of ideas are they, exactly? A **theory** is a well-developed set of ideas that propose an explanation for observed phenomena. Theories are repeatedly checked against the world, but they tend to be too complex to be tested all at once; instead, researchers create hypotheses to test specific aspects of a theory.

A **hypothesis** is a testable prediction about how the world will behave if our idea is correct, and it is often worded as an if-then statement (e.g., if I study all night, I will get a passing grade on the test). The hypothesis is critical because it bridges the gap between the realm of ideas and the real world. As specific hypotheses are tested, theories are modified and refined to reflect and incorporate the result of these tests (Figure 3.2).

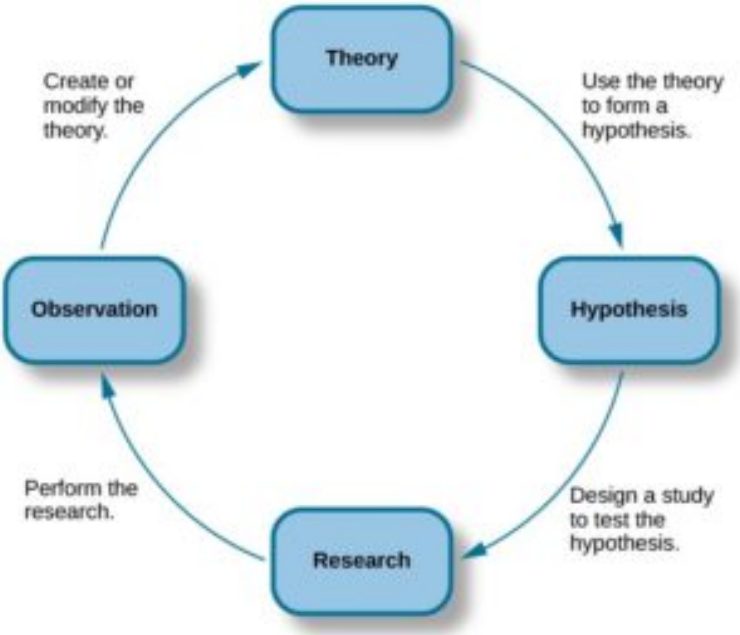

Figure 2. The scientific method of research includes proposing hypotheses, conducting research, and creating or modifying theories based on results.

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To see how this process works, let us consider a specific theory and a hypothesis that might be generated from that theory. The James-Lange theory of emotion asserts that emotional experience relies on the physiological arousal associated with the emotional state. If you walked out of your home and discovered a very aggressive snake waiting on your doorstep, your heart would begin to race and your stomach churn. According to the James-Lange theory, these physiological changes would result in your feeling of fear. A hypothesis that could be derived from this theory might be that a person who is unaware of the physiological arousal that the sight of the snake elicits will not feel fear.

A scientific hypothesis is also **falsifiable** or capable of being shown to be incorrect. For example, Sigmund Freud had lots of interesting ideas to explain various human behaviors; however, a major criticism of Freud's theories is that many of his ideas cannot be empirically tested and thus are not falsifiable. Despite this, Freud's theories are widely taught in introductory psychology texts because of their historical significance for personality psychology and psychotherapy, and these remain the root of all modern forms of therapy.

In contrast, the James-Lange theory does generate falsifiable hypotheses, such as the one described above. Some individuals who

suffer significant injuries to their spinal columns are unable to feel the bodily changes that often accompany emotional experiences. Therefore, we could test the hypothesis by determining how emotional experiences differ between individuals who can detect these changes in their physiological arousal and those who do not. In fact, this research has been conducted, and while the emotional experiences of people deprived of an awareness of their physiological arousal may be less intense, they still experience emotion (Chwalisz, Diener, & Gallagher, 1988).

Scientific research's dependence on falsifiability allows for high confidence in the information that it produces. Typically, by the time information is accepted by the scientific community, it has been tested repeatedly. However, in the early years of studying development, theories were often based on philosophy and inductive reasoning, and could not always provide empirical evidence to support these ideas. In the late 1800s, a transformation occurred when philosophy met physiology and adopted the scientific methods used by the physical sciences to explore questions about behavior and the mind.

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Video 1. *Hypothesis vs Theory* explains the differences between the two.

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History of Developmental Psychology

Figure 1. Some key figures in the early development of psychology. Front row: Sigmund Freud, G. Stanley Hall, Carl Jung. Back row: Abraham A. Brill, Ernest Jones, Sándor Ferenczi, at Clark University in Worcester, Massachusetts. Date: September 1909.

The scientific study of children and adolescents began in the late nineteenth century and blossomed in the early twentieth century as pioneering psychologists sought to uncover the secrets of human behavior by studying its development. Three early scholars, John Locke, Jean-Jacques Rousseau, and Charles Darwin, proposed theories of human behavior that are the "direct ancestors of the

three major theoretical traditions" of developmental psychology today" (Vasta et al., 1998, p. 10). Locke, a British empiricist, adhered to a strict environmentalist position, that the mind of the newborn as a tabula rasa ("blank slate") on which knowledge is written through experience and learning. Rousseau, a Swiss philosopher who spent much of his life in France, proposed a nativistic model in his famous novel, *Emile*, in which development occurs according to innate processes progressing through three stages: Infans (infancy), puer (childhood), and adolescence. Rousseau detailed some of the necessary progression through these stages in order to develop into an ideal citizen. Although some aspects of his text were controversial, Rousseau's ideas were powerfully influential on educators at the time. Finally, the work of Darwin, the British biologist famous for his theory of evolution, led others to suggest that development proceeds through evolutionary recapitulation, with many human behaviors having their origins in successful adaptations in the past as "ontogeny recapitulates phylogeny."

G. Stanley Hall

Darwin's theories greatly influenced G. Stanley Hall, who believed that children developed over their lifetime much in the same way that a species evolved throughout time. His interests focused on childhood development, adolescence, and evolutionary theory. His significant contributions to the field are that he taught the first courses in child development, several of his students becoming leading researchers in the field, and he established scientific journals for the publication of child development research. He was also the first president of the American Psychological Association.

James Mark Baldwin

Another early contributor to the study of development was James Mark Baldwin (1861-1934), a Princeton-educated American philosopher and psychologist who did quantitative and experimental research on infant development. He made important contributions to early psychology, psychiatry, and the theory of evolution. Baldwin wrote essays such as "Mental Development in the Child and the Race: Methods and Processes," which made a vivid impression on Jean Piaget (who later developed the most popular theory of cognitive development) and Lawrence Kohlberg (who developed a theory about moral judgment and development).

John B. Watson

The 20th century marked the formation of qualitative distinctions between children and adults. When John Watson wrote the book *Psychological Care Of Infant And Child*, in 1928, he sought to add clarification surrounding behaviorists' views on child care and development. Watson was the founder of the field of behaviorism, which emphasized the role of nurture, or the environment, in human development. He believed, based on Locke's environmentalist position, that human behavior can be understood in terms of experiences and learning. He believed that all behaviors are learned, or conditioned, as evidenced by his famous "Little Albert" study, in which he conditioned an infant to fear a white rat. In Watson's book on the care of the infant and child, Watson explained that children should be treated as a young adult—with respect, but also without emotional attachment. In the book, he warned against the inevitable dangers of a mother providing too much love and affection. Watson explained that love, along with all things observable behavior, is conditioned. Watson supported

his warnings by mentioning invalidism, saying that society does not overly comfort children as they become young adults in the real world, so parents should not set up these unrealistic expectations. His book was highly criticized but was still influential in promoting more research into early childhood behavior and development.

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Sigmund Freud

Another name you are probably familiar with who was influential in the study of development is Sigmund Freud. Sigmund Freud's model of 'psychosexual development' grew out of his psychoanalytic approach to human personality and psychopathology. In sharp contrast to the objective approach espoused by Watson, Freud based his model of child development on his own and his patients' recollections of their childhood. He developed a stage model of development in which the libido, or sexual energy, of the child focuses on different "zones" or areas of the body as the child grows to adulthood. Freud's model is an "interactionist" one since he believed that although the sequence and timing of these stages are biologically determined, successful personality development depends on the experiences the child has during each stage. Although the details of Freud's developmental theory have been widely criticized, his emphasis on the importance of early childhood experiences, prior to five years of age, has had a lasting impact.

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Arnold Gesell

Arnold Gesell, a student of G. Stanley Hall, carried out the first large-scale detailed study of children's behavior, authoring several books on the topic in the 1920s, 30s, and 40s. His research revealed consistent patterns of development, supporting his view that human development depends on biological "maturation," with the environment providing only minor variations in the age at which a skill might emerge but never affecting the sequence or pattern. Gesell's research produced norms, such as the order and the average age range in which a variety of early behaviors such as sitting, crawling, and walking emerge. In conducting his studies, Gesell developed sophisticated observational techniques, including one-way viewing screens and recording methods that did not disturb the child.

Jean Piaget

Jean Piaget (1896-1980) is considered one of the most influential psychologists of the twentieth century, and his stage theory of cognitive development revolutionized our view of children's thinking and learning. His work inspired more research than any

other theorist, and many of his concepts are still foundational to developmental psychology. His interest lay in children's knowledge, their thinking, and the qualitative differences in their thinking as it develops. Although he called his field "genetic epistemology," stressing the role of biological determinism, he also assigned great importance to experience. In his view, children "construct" their knowledge through processes of "assimilation," in which they evaluate and try to understand new information, based on their existing knowledge of the world, and "accommodation," in which they expand and modify their cognitive structures based on new experiences.

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Contemporary Psychological Approaches

Many of the early psychological theories and approaches changed over the years, as new evidence shed light on behavior and development. Some of these approaches have remained a constant influence, some have changed significantly over the years, and some have faded into history. Currently, several major contemporary approaches apply to development: psychodynamic, behavioral, humanistic, cognitive, contextual, biological, and evolutionary approaches.

Regardless of changes to these psychological approaches, throughout history and still in the present day, key issues remain among which developmental theorists often disagree. Particularly oft-disputed is the role of early experiences on later development in opposition to current behavior reflecting present experiences–namely the *passive versus active issue*. Likewise, whether or not development is best viewed as occurring in stages or rather as a gradual and cumulative process of change has traditionally been up for debate – a question of *continuity versus discontinuity*. Also, consider whether the pattern of change the same for everyone, or are there different patterns of change—one course of development versus many courses. Further, the role of heredity and the environment in shaping human development is a much-contested topic of discussion – also referred to as *nature versus nurture debate*. We will examine each of these issues in more detail throughout the chapter.

Psychodynamic Approach

Freud's Psychoanalytic Approach

As previously mentioned, Sigmund Freud (1856-1939), an Austrian neurologist, is probably the most recognized name in psychology, His psychodynamic approach **to** development and psychopathology dominated the field of psychiatry until the growth of behaviorism in the 1930s and beyond. The **psychodynamic approach** emphasizes unconscious psychological processes (for example, wishes and fears of which we are not fully aware), and contends that childhood experiences are crucial in shaping adult personality (Thorne & Henley, 2005). Freud theorized that many of his patients' problems arose from the unconscious mind. In Freud's view, the unconscious mind was a repository of feelings and urges of which we have no awareness. Gaining access to the unconscious, then, was crucial to the successful resolution of the patient's problems. According to Freud, the unconscious mind could be accessed through dream analysis, by examinations of the first words that came to people's minds, and through seemingly innocent slips of the tongue.

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Video 1. *Psychoanalytic Theory* explains the various levels of the

mind and how we develop and behave based on the influences of these various levels.

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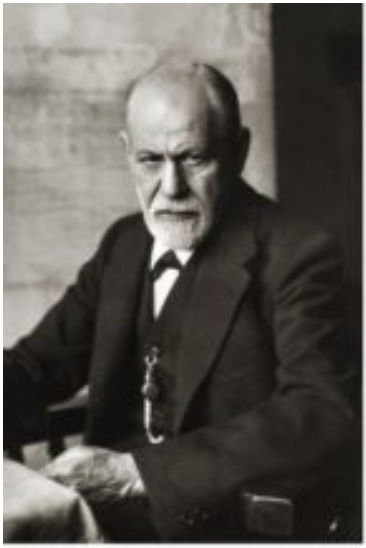
Freud also made contributions to the advancement of psychotherapy. He began working with 'hysterical' patients and discovered that when they began to talk about some of their life experiences, particularly those that took place in early childhood, their symptoms disappeared. This led him to suggest the first purely psychological explanation for physical problems and mental illness. What he proposed was that unconscious motives, desires, fears, and anxieties drive our actions. When upsetting memories or thoughts begin to find their way into our consciousness, we develop defenses to shield us from these painful realities, called defense mechanisms. Freud believed that many mental illnesses are a result of a person's inability to accept reality.



(a)

A General Introduction
to
Psychoanalysis

BY

PROF. SIGMUND FREUD, LL.D.

G. STANLEY HALL

BONI AND LIVERIGHT
PUBLISHERS NEW YORK

(b)

Figure 1. (a) Sigmund Freud was highly influential in the history of psychology. (b) One of his many books, *A General Introduction To Psychoanalysis*, shared his ideas about psychoanalytical therapy; it was published in 1922.

While many of Freud's theories have lost favor, he is still considered to be a very influential figure in the area of development. Freud was the first to systematically study and theorize the workings of the unconscious mind in the manner that we associate with modern psychology. Because psychodynamic theories are difficult to prove wrong, evaluating those theories, in general, is difficult in that we cannot make definite predictions about a given individual's behavior using the theories. The theory is also considered to be sexist in suggesting that women who do not accept an inferior position in society are somehow psychologically flawed. Freud focused on the darker side of human nature and suggested that much of what determines our actions are unknown to us. Others criticize that the psychodynamic approach is too

deterministic, relating to the idea that all events, including human action, are ultimately determined by causes regarded as external to the will, thereby leaving little room for the idea of free will (De St Aubin, 2004).

The psychodynamic perspective has evolved considerably since Freud's time, encompassing all the theories in psychology that see human functioning based upon the interaction of conscious and unconscious drives and forces within the person, and between the different structures of the personality.

Erickson's Psychosocial Theory

Now, let us turn to a less controversial psychodynamic theorist, the father of developmental psychology, Erik Erikson (1902-1994). Erikson was a student of Freud's and expanded on his theory of psychosexual development by emphasizing the importance of culture in parenting practices and motivations and adding stages of adult development (Erikson, 1950; 1968).

As an art school dropout with an uncertain future, young Erik Erikson met Freud's daughter, Anna Freud, while he was tutoring the children of an American couple undergoing psychoanalysis in Vienna. It was Anna Freud who encouraged Erikson to study psychoanalysis. Erikson received his diploma from the Vienna Psychoanalytic Institute in 1933, and as Nazism spread across Europe, he fled the country and immigrated to the United States that same year. Erikson later proposed a

psychosocial theory of development, suggesting that an individual's personality develops throughout the lifespan—a departure from Freud's view that personality is fixed in early life. In his theory, Erikson emphasized the social relationships that are important at each of the eight-stage of psychosocial development, each of which includes a conflict or developmental task. The development of a healthy personality and a sense of competence depend on the successful completion of each task. His stage theory was also different than his predecessor in that he emphasized development throughout the lifespan, not just until adulthood.

Figure 2. Erik Erikson

Table 1. Erikson's Psychosocial Stage Theory

Stage	Approximate Age (years)	Virtue: Developmental Task	Description
1	0-1	**Hope: Trust vs. Mistrust**	Trust (or mistrust) that basic needs, such as nourishment and affection, will be met
2	1-3	**Will: Autonomy vs. Shame**	Sense of independence in many tasks develops
3	3-6	**Purpose: Initiative vs. Guilt**	Take initiative on some activities, may develop guilt when success not met or boundaries overstepped
4	7-11	**Competence: Industry vs. Inferiority**	Develop self-confidence in abilities when competent or sense of inferiority when not
5	12-18	**Fidelity: Identity vs. Role Confusion**	Experiment with and develop identity and roles
6	19-39	**Love: Intimacy vs. Isolation**	Establish intimacy and relationships with others
7	40-64	**Care: Generativity vs. Stagnation**	Contribute to society and be part of a family
8	65+	**Wisdom: Integrity vs. Despair**	Assess and make sense of life and meaning of contributions

Erikson's eight stages form a foundation for discussions on emotional and social development during the lifespan. Keep in mind, however, that these stages or crises can occur more than once or at different times of life. For instance, a person may struggle with a lack of trust beyond infancy. Erikson's theory is criticized for focusing so heavily on stages and assuming that the completion of one stage is a prerequisite for the next crisis of development. His theory also focuses on the social expectations found in certain cultures, but not in all. For instance, the idea that adolescence is a time of searching for identity might translate well in the middle-class culture of the United States, but not as well in cultures where the transition into adulthood coincides with puberty through rites of passage and where adult roles offer fewer choices.

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Video 2. Erikson's Psychosocial Development explains how humans progress through various stages.

By and large, Erikson's view that development continues throughout the lifespan is very significant and has received great recognition. However, like Freud's theory, it has been criticized for focusing on more men than women and also for its vagueness, making it difficult to test rigorously.

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Behavioral Approach

Behaviorism emerged early in the 20th century and became a significant force in American psychology. The **behavioral approach** suggests that the keys to understanding development are observable behavior and external stimuli in the environment. Behaviorism is a theory of learning, and learning theories focus on how we are conditioned to respond to events or stimuli. These theories explain how experience determines behavior.

Championed by psychologists such as John B. Watson (1878–1958) and B. F. Skinner (1904–1990), behaviorism rejected any reference to mind and viewed overt and observable behavior as the proper subject matter of psychology. Through the scientific study of behavior, it was hoped that laws of learning could be derived that would promote the prediction and control of behavior. Russian physiologist Ivan Pavlov (1849–1936) influenced early behaviorism in America. His work on conditioned learning, popularly referred to as classical conditioning, provided support for the notion that learning and behavior were controlled by events in the environment and could be explained with no reference to mind or consciousness (Fancher, 1987).

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Video 1. *How to Train a Brain* explains behaviorist theories of classical and operant conditioning.

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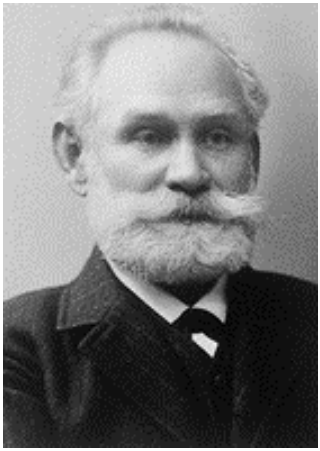
Pavlov's Classical Conditioning



Early work in the field of behavior was conducted by the Russian physiologist Ivan Pavlov (1849–1936). Pavlov studied a form of learning behavior called a conditioned reflex, in which an animal or human produced a reflex (unconscious) response to a stimulus and, over time, was conditioned to produce the response to a different stimulus that the experimenter associated with the original stimulus. The reflex Pavlov worked with was salivation in response to the presence of food. The salivation reflex could be elicited using a second stimulus, such as a specific sound, that was presented in association with the initial food stimulus several times. Once the response to the second stimulus was "learned," the food stimulus could be omitted. Pavlov's "classical conditioning" is only one form of learning behavior studied by behaviorists.

Figure 3.6.1. Ivan Pavlov

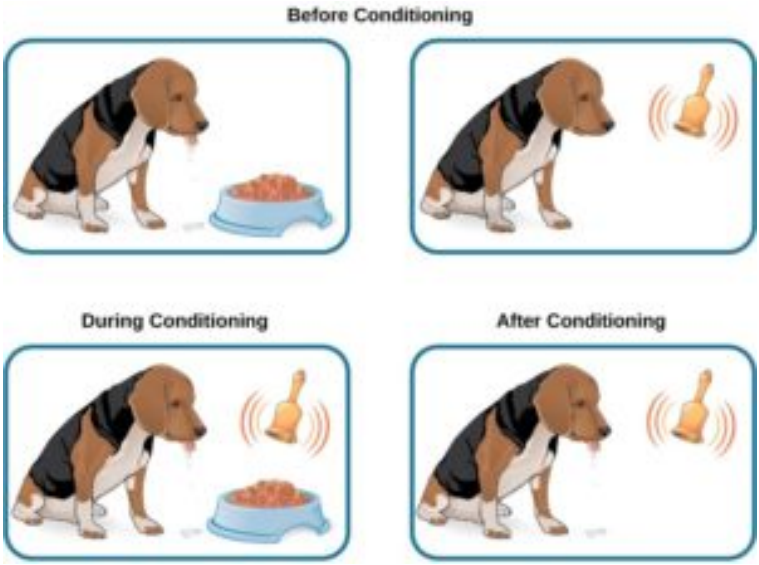


Figure 2. Before conditioning, an unconditioned stimulus (food) produces an unconditioned response (salivation), and a neutral stimulus (bell) does not produce a response. During conditioning, the unconditioned stimulus (food) is presented repeatedly just after the presentation of the neutral stimulus (bell). After conditioning, the neutral stimulus alone produces a conditioned response (salivation), thus becoming a conditioned stimulus.

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Video 2. *Classical Conditioning* explains the process used in classical learning.

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Watson and Behaviorism

John B. Watson (1878–1958) was an influential American psychologist whose most famous work occurred during the early 20th century at Johns Hopkins University. Watson thought that the study of consciousness was flawed because objective analysis of the mind was impossible. Watson preferred to focus directly on observable behavior and try to bring that behavior under control. Watson was a major proponent of shifting the focus of psychology from the mind to behavior, and this approach of observing and controlling behavior, and is considered the father of **behaviorism**. A significant object of study by behaviorists was learned behavior and its interaction with inborn qualities of the

organism. Behaviorism commonly used animals in experiments under the assumption that what was learned using animal models could, to some degree, be applied to human behavior. Indeed, Tolman (1938) stated, "I believe that everything important in psychology (except … such matters as involve society and words) can be investigated in essence through the continued experimental and theoretical analysis of the determiners of rat behavior at a choice-point in a maze."

Figure 3. John B. Watson

Behaviorism dominated experimental psychology for several decades, and its influence can still be felt today (Thorne & Henley, 2005). Behaviorism is largely responsible for establishing psychology as a scientific discipline through its objective methods and especially experimentation. In addition, this approach is used in behavioral and cognitive-behavioral therapy. Behavior modification is commonly used in classroom settings. Behaviorism has also led to research on environmental influences on human behavior.

Skinner and Operant Conditioning

B. F. Skinner (1904–1990) was an American psychologist. Like Watson, Skinner was a behaviorist, and he concentrated on how behavior was affected by its consequences. Therefore, Skinner spoke of reinforcement and punishment as major factors in driving behavior. As a part of his research, Skinner developed a chamber that allowed the careful study of the principles of modifying behavior through reinforcement and punishment. This device, known as an operant conditioning chamber (or more familiarly, a Skinner box), has remained a crucial resource for researchers studying behavior (Thorne & Henley, 2005).

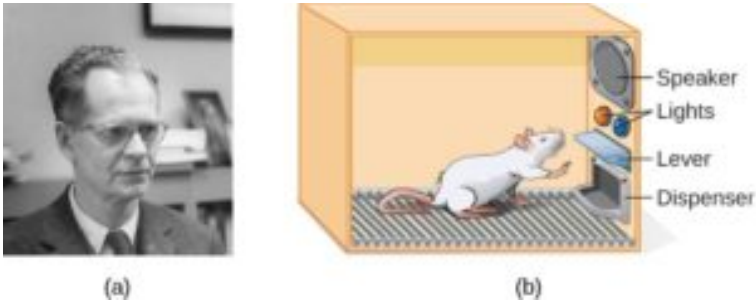

Figure 4. (a) B. F. Skinner is famous for his research on operant conditioning. (b) Modified versions of the operant conditioning chamber, or Skinner box, are still widely used in research settings today.

The Skinner box is a chamber that isolates the subject from the external environment and has a behavior indicator such as a lever or a button. When the animal pushes the button or lever, the box can deliver a positive reinforcement of the behavior (such as food) or a punishment (such as noise) or a token conditioner (such as a light) that is correlated with either the positive reinforcement or punishment.

Skinner's focus on positive and negative reinforcement of learned behaviors had a lasting influence in psychology that has waned somewhat since the growth of research in cognitive psychology. Despite this, conditioned learning is still used in human behavioral modification. Skinner's two widely read and controversial popular science books about the value of operant conditioning for creating happier lives remain as thought-provoking arguments for his approach (Greengrass, 2004).

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Video 3. *Operant Conditioning explains the various types of consequences that influence behavior.*

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Social Learning Theory: Observational Learning

Albert Bandura's ideas about learning were different from those of strict behaviorists. Bandura proposed a brand of behaviorism called **social learning theory**, which took cognitive processes and social contexts into account; it takes into consideration the dynamic and reciprocal interaction of the person, environment, and behavior. According to Bandura, pure behaviorism could not explain why learning can take place in the absence of external reinforcement. He felt that internal mental processes, like thinking and motivation, must also have a role in learning.

Observational learning is a component of Albert Bandura's Social Learning Theory (Bandura, 1977). In **observational learning**, we learn by watching others and then imitating, or modeling, what

they do or say. The individuals performing the imitated behavior are called **models**. Bandura identified three kinds of models: live, verbal, and symbolic. A live model demonstrates a behavior in person. A verbal instructional model does not perform the behavior but instead explains or describes the behavior. A symbolic model demonstrates behavior in forms of media.

Of course, we do not learn a behavior by merely observing a model. Bandura described specific steps in the process of modeling that must be followed if learning is to be successful: attention, retention, reproduction, and motivation. First, you must be focused on what the model is doing—you have to pay attention. Next, you must be able to retain, or remember, what you observed; this is retention. Then, you must be able to perform the behavior that you observed and committed to memory; this is reproduction. Finally, you must have motivation. You need to want to copy the behavior, and whether or not you are motivated depends on what happened to the model. If you saw that the model was reinforced for her behavior, you will be more motivated to copy her. This is known as **vicarious reinforcement**. On the other hand, if you observed the model being punished, you would be less motivated to copy her. This is called **vicarious punishment**.

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Video 4. *Albert Bandura Bobo Doll Experiment* explains how learning occurs through observation and demonstrates this through his Bobo doll experiment with preschool children.

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Humanistic Approach

During the early 20th century, American psychology was dominated by behaviorism and psychoanalysis. However, some psychologists were uncomfortable with what they viewed as limited perspectives being so influential to the field. They objected to the pessimism and determinism (all actions driven by the unconscious) of Freud. They also disliked the reductionism, or simplifying nature, of behaviorism. Behaviorism is also deterministic at its core because it sees human behavior as entirely determined by a combination of genetics and the environment. Some psychologists began to form their own ideas that emphasized personal control, intentionality, and a true predisposition for "good" as necessary for our self-concept and our behavior. Thus, humanism emerged. **Humanism** is a perspective within psychology that emphasizes the potential for good that is innate to all humans. Two of the most well-known proponents of humanistic psychology are Abraham Maslow and Carl Rogers (O'Hara, n.d.).

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Video 1. *Humanistic Theory* explained.

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Maslow's Hierarchy of Needs

Abraham Maslow (1908–1970) was an American psychologist who is best known for proposing a hierarchy of human needs in motivating behavior (figure below). Maslow asserted that so long as basic needs necessary for survival were met (e.g., food, water, shelter), higher-level needs (e.g., social needs) would begin to motivate behavior. According to Maslow, the highest-level needs relate to self-actualization, a process by which we achieve our full potential. The focus on the positive aspects of human nature that are characteristic of the humanistic perspective is evident (Thorne & Henley, 2005).

Figure 1. Maslow's hierarchy of needs.

Humanistic psychologists rejected, on principle, the research approach based on reductionist experimentation in the tradition of the physical and biological sciences, because it missed the "whole" human being. Beginning with Maslow and Rogers, there was an insistence on a humanistic research program. This program has been mostly qualitative (not measurement-based), but there exist a number of quantitative research strains within humanistic psychology, including research on happiness, self-concept,

meditation, and the outcomes of humanistic psychotherapy (Friedman, 2008).

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Video 2. *Maslow's Hierarchy of Needs* explained.

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Cognitive Approach

Behaviorism's emphasis on objectivity and focus on external behavior had pulled psychologists' attention away from the mind for a prolonged time. The early work of the humanistic psychologists redirected attention to the individual human as a whole, and as a conscious and self-aware being. By the 1950s, new disciplinary perspectives in linguistics, neuroscience, and computer science were emerging, and these areas revived interest in the mind as a focus of scientific inquiry. This particular perspective has come to be known as the cognitive revolution (Miller, 2003). By 1967, Ulric Neisser published the first textbook entitled *Cognitive Psychology*, which served as a core text in cognitive psychology courses around the country (Thorne & Henley, 2005).

Although no one person is entirely responsible for starting the cognitive revolution, Noam Chomsky was very influential in the early days of this movement. Chomsky (1928–), an American linguist, was dissatisfied with the influence that behaviorism had had on psychology. He believed that psychology's focus on behavior was short-sighted and that the field had to re-incorporate mental functioning into its purview if it were to offer any meaningful contributions to understanding behavior (Miller, 2003).

European psychology had never really been as influenced by behaviorism as had American psychology, and thus, the cognitive revolution helped reestablish lines of communication between European psychologists and their American counterparts. Furthermore, psychologists began to cooperate with scientists in other fields, like anthropology, linguistics, computer science, and neuroscience, among others. This interdisciplinary approach often was referred to as the cognitive sciences, and the influence and prominence of this particular perspective resonates in modern-day psychology (Miller, 2003). Today, the **cognitive approach** is the area

of psychology that focuses on studying cognitions, or thoughts, and their relationship to our experiences and our actions.

Cognitive psychologists have research interests that span a spectrum of topics, ranging from attention to problem-solving to language to memory. The approaches used in studying these topics are equally diverse. Given such diversity, cognitive psychology is not captured in one chapter of this text per se; rather, various concepts related to cognitive psychology will be covered in relevant portions of the chapters in this text on sensation and perception, thinking and intelligence, memory, lifespan development, social psychology, and therapy.

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Piaget's Psychological Constructivism

Jean Piaget (1896–1980) is another stage theorist who studied childhood development. Instead of approaching development from a psychoanalytical or psychosocial perspective, Piaget focused on children's cognitive growth. He believed that thinking is a central aspect of development and that children are naturally inquisitive. However, he said that children do not think and reason like adults (Piaget, 1930, 1932). His theory of cognitive development holds that our cognitive abilities develop through specific stages, which exemplifies the discontinuity approach to development. As we

progress to a new stage, there is a distinct shift in how we think and reason.

Piaget believed that we are continuously trying to maintain cognitive equilibrium or a balance or cohesiveness in what we see and what we know. Children have much more of a challenge in maintaining this balance because they are continually being confronted with new situations, new words, new objects, etc. When faced with something new, a child may either fit it into an existing framework (**schema**) and match it with something known (**assimilation**) such as calling all animals with four legs "doggies" because he or she knows the word doggie, or expand the framework of knowledge to accommodate the new situation (**accommodation**) by learning a new word to more accurately name the animal. This is the underlying dynamic in our cognition. Even as adults, we continue to try and make sense of new situations by determining whether they fit into our old way of thinking or whether we need to modify our thoughts.

As we mature and develop our schemas, we move through four distinct stages of cognitive development. Piaget proposed that specific developmental tasks were to be mastered during each stage, and as children progressed, they became more cognitively sophisticated.

Figure 1. Jean Piaget

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Table 1. Piaget's stages of cognitive development

Age	Stage	Description of Cognitive Development	Major Developmental Tasks
Infancy(0-2 years)	Sensorimotor	Take in sensory information and respond through motor activity. Motor responses begin as reflexes, become purposeful, and then become more sophisticated in response to sensory information.	• Master object permanence· • Learn to use symbols, images, and words to represent objects and thoughts· • Develop a sense of "self" separate from others
Preschool(2-7 years)	Pre-Operational	Display of intelligent thought. Children attempt to understand and explain their world but will make many errors in their assessments.	• Correct errored thinking· • Overcome egocentric perspective
Elementary School(7-11 years)	Concrete Operational	Children use operations (internal operations) to think logically and systematically. Operations allow the mental manipulation of information.	• Master conservation· • Understand reversibility· • Spontaneously classify information/objects· • Understand deception

Adolescence (11+ years)	Formal Operational	Teens and adults develop systematic, logical algorithms for thinking through problems.	• Capable of abstract thought· • Thinking about hypotheticals· • Tends to be idealistic

As with other major contributors to theories of development, several of Piaget's ideas have come under criticism based on the results of further research. For example, several contemporary studies support a model of development that is more continuous than Piaget's discrete stages (Courage & Howe, 2002; Siegler, 2005, 2006). Many others suggest that children reach cognitive milestones earlier than Piaget describes (Baillargeon, 2004; de Hevia & Spelke, 2010). Looking across cultures reveals considerable variation in what children are able to do at various ages, and Piaget may have underestimated what children are capable of given the right circumstances.

According to Piaget, the highest level of cognitive development is formal operational thought, which develops between 11 and 20 years old. However, many developmental psychologists disagree with Piaget, suggesting a fifth stage of cognitive development, known as the postformal stage (Basseches, 1984; Commons & Bresette, 2006; Sinnott, 1998). In postformal thinking, decisions are made based on situations and circumstances, and logic is integrated with emotion as adults develop principles that depend on contexts. One way that we can see the difference between an adult in postformal thought and an adolescent (or adult) in formal operations is in terms of how they handle emotionally charged issues or integrate systems of thought.

Information-Processing Theories

Information-processing theories have become an influential alternative to Piaget's approach. The theory assumes that even complex behavior such as learning, remembering, categorizing, and thinking can be broken down into a series of individual, specific steps, and as a person develops strategies for processing information, they can learn more complex information. This perspective equates the mind to a computer, which is responsible for analyzing information from the environment.

The most common information-processing model is applied to an understanding of memory and the way that information is encoded, stored, and then retrieved from the brain (Atkinson & Shiffrin, 1968), but information processing approaches also apply to cognitive processing in general. According to the standard information-processing model for mental development, the mind's machinery includes attention mechanisms for bringing information in, working memory for actively manipulating information, and long-term memory for passively holding information so that it can be used in the future.

This theory addresses how, as children grow, their brains likewise mature, leading to advances in their ability to process and respond to the information they received through their senses. The theory emphasizes a continuous pattern of development, in contrast with cognitive-developmental theorists such as Piaget, who thought development occurred in stages. Developmental psychologists who adopt the information-processing perspective account for mental development in terms of maturational changes in basic components of a child's mind. At the same time, they do not offer a complete explanation of behavior. For example, they have paid little attention to behavior such as creativity, in which the most profound ideas often are developed in a seemingly not logical, nonlinear manner. Moreover, they do not take into account the social context in which development takes place.

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link to learning

View a brief video recapping some of the major concepts explored by cognitive psychologists.

Contextual Approach

The **contextual approach** considered the relationship between individuals and their physical, cognitive, and social worlds. They also examine socio-cultural and environmental influences on development. We will focus on two influential theorists who pioneered this perspective: Lev Vygotsky and Urie Bronfenbrenner. Lev Vygotsky was a Russian psychologist who is best known for his sociocultural theory. He believed that social interaction plays a critical role in children's learning; through such social interactions, children go through a continuous process of scaffolded learning. Urie Bronfenbrenner developed the ecological systems theory to explain how everything in a child and the child's environment affects how a child grows and develops. He labeled different aspects or levels of the environment that influence children's development.

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Vygotsky's Sociocultural Theory

Figure 1. Lev Vygotsky, founder of the sociocultural theory, which emphasizes contextual factors in cognitive development

Modern social learning theories stem from the work of Russian psychologist Lev Vygotsky (Kozulin, 1990). Vygotsky's ideas are most recognized for identifying the role of social interactions and culture in the development of higher-order thinking skills. His theory is especially valuable for the insights it provides about the dynamic "interdependence between individual and social processes in the construction of knowledge" (John-Steiner & Mahn, 1996, p. 192). Vygotsky's views are often considered primarily as cognitive development theories, focusing on qualitative changes in the

development of thought, language, and higher-order thinking skills. Although Vygotsky's intent was mainly to understand higher psychological processes in children, his ideas have many implications and practical applications for learners of all ages.

Three themes are often identified with Vygotsky's ideas of sociocultural learning: (1) human development and learning originate in social, historical, and cultural interactions, (2) use of psychological tools, particularly language, mediate development of higher mental functions, and (3) learning occurs within the Zone of Proximal Development. While we discuss these ideas separately, they are closely interrelated, non-hierarchical, and connected.

Vygotsky's **sociocultural theory** emphasizes the importance of culture and interaction in the development of cognitive abilities. Vygotsky contended that thinking has social origins, social interactions play a critical role, especially in the development of higher-order thinking skills, and cognitive development cannot be fully understood without considering the social and historical context within which it is embedded. He explained, "Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (interpsychological) and then inside the child (intrapsychological)" (Vygotsky, 1978, p. 57). It is through working with others on a variety of tasks that a learner adopts socially shared experiences and associated effects and acquires useful strategies and knowledge (Scott & Palincsar, 2013).

Rogoff (1990) refers to this process as guided participation, where a learner actively acquires new culturally valuable skills and capabilities through a meaningful, collaborative activity with an assisting, more experienced other. It is critical to notice that these culturally mediated functions are viewed as being embedded in sociocultural activities rather than being self-contained. Development is a "transformation of participation in a sociocultural activity," not a transmission of discrete cultural knowledge or skills (Matusov, 2015, p. 315).

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Scaffolding and the Zone of Proximal Development

Vygotsky differed with Piaget in that he believed that a person has not only a set of abilities but also a set of potential abilities that can be realized if given the proper guidance from others. He believed that through guided participation known as **scaffolding**, with a teacher or capable peer, a child could learn cognitive skills within a certain range known as the **zone of proximal development**. While Piaget's ideas of cognitive development assume that development through certain stages is biologically determined, originates in the individual, and precedes cognitive complexity, Vygotsky presents a different view in which learning drives development. The idea of learning driving development, rather than being determined by the developmental level of the learner, fundamentally changes our understanding of the learning process and has significant instructional and educational implications (Miller, 2011).

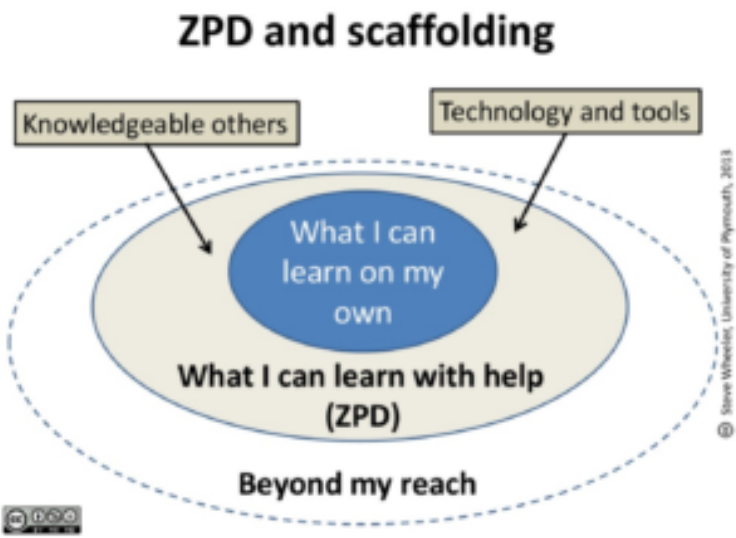

Figure 2. Model of zone of proximal development.

Have you ever taught a child to perform a task? Maybe it was brushing their teeth or preparing food. Chances are you spoke to them and described what you were doing while you demonstrated the skill and let them work along with you throughout the process. You assisted them when they seemed to need it, but once they knew what to do-you stood back and let them go. This is scaffolding. Educators have also adopted this approach to teaching. Rather than assessing students on what they are doing, they should be understood in terms of what they are capable of doing with the proper guidance.

This difference in assumptions has significant implications for the design and development of learning experiences. If we believe as Piaget did that development precedes learning, then we will make sure that new concepts and problems are not introduced until learners have developed innate capabilities to understand them. On the other hand, if we believe as Vygotsky did that learning drives

development and that development occurs as we learn a variety of concepts and principles, recognizing their applicability to new tasks and new situations, then our instructional design will look very different.

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Video 1. *Vygotsky's Sociocultural Development* explains the influence of the social environment on cognition and how more knowledgeable others help us learn within our zone of proximal development.

Bronfenbrenner's Ecological Systems Theory

Another psychologist who recognized the importance of the environment on development was American psychologist Urie Bronfenbrenner (1917-2005), who formulated the **ecological systems theory** to explain how the inherent qualities of a child and their environment interact to influence how they will grow and develop. The term "ecological" refers to a natural environment; human development is understood through this model as a long-lasting transformation in the way one perceives and deals with the environment. Bronfenbrenner's ecological theory stresses the importance of studying children in the context of multiple environments because children typically find themselves enmeshed simultaneously in different ecosystems. Each of these systems

inevitably interacts with and influence each other in every aspect of the child's life, from the most intimate level to the broadest. Furthermore, he eventually renamed his theory the **bioecological model** in order to recognize the importance of biological processes in development. However, he only recognized biology as producing a person's potential, with this potential being realized or not via environmental and social forces.

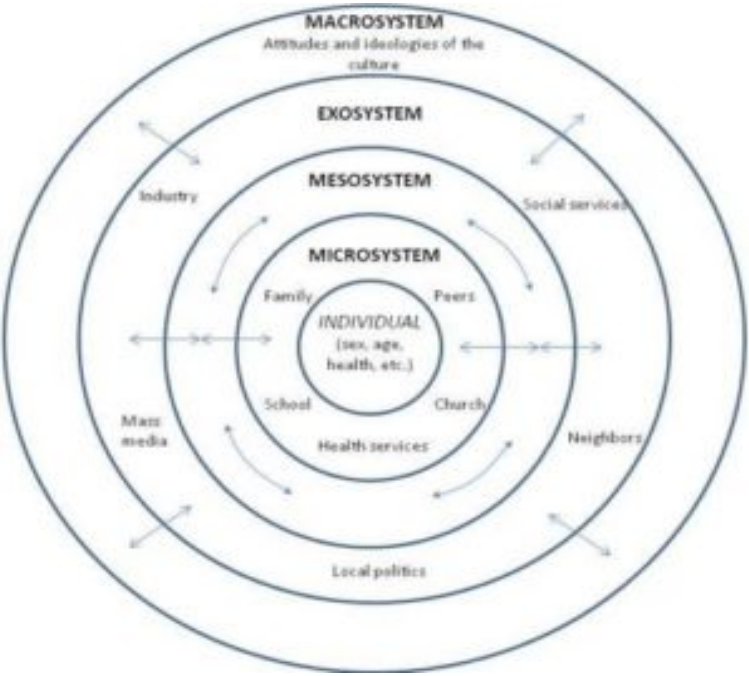

Figure 3. Bronfenbrenner's ecological theory emphasizes the influence of microsystems, mesosystems, exosystems, and macrosystems on an individual. Not pictured is the chronosystem, or the historical context and timeframe which provides the context for all the other systems. The chronosystem includes environmental events, major life transitions, and historical events.

An individual is impacted by **microsystems** such as parents or

siblings–those who have direct, significant contact with the person. The input of those people is modified by the cognitive and biological state of the individual as well. These influence the person's actions, which in turn influence systems operating on them. The **mesosystem** includes larger organizational structures such as school, the family, or religion. These institutions impact the microsystems just described. For example, the religious teachings and traditions of a family may create a climate that makes the family feel stigmatized, and this indirectly impacts the child's view of themself and others. The philosophy of the school system, daily routine, assessment methods, and other characteristics can affect the child's self-image, growth, sense of accomplishment, and schedule, thereby impacting the child physically, cognitively, and emotionally. These mesosystems both influence and are influenced by the broader contexts of the community, referred to as the **exosystem**. A community's values, history, and economy can impact the organizational structures it houses. Furthermore, the community is influenced by **macrosystems**, which are cultural elements such as global economic conditions, war, technological trends, values, philosophies, and society's responses to the global community. In sum, a child's experiences are shaped by larger forces such as family, school, religion, and culture. All of this occurs within the relevant historical context and timeframe, or **chronosystem**. The chronosystem is made up of the environmental events and transitions that occur throughout a child's life, including any socio-historical events. This system consists of all the experiences that a person has had during their lifetime.

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Video 1. *Bronfenbrenner's Ecological Theory* explains the various layers, the interactions between them, and the influence this has on individual development.

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Biopsychology and Evolutionary Psychology

Biopsychology

As the name suggests, **biopsychology** explores how our biology influences our behavior. While biological psychology is a broad field, many biological psychologists want to understand how the structure and function of the nervous system are related to behavior (figure below). As such, they often combine the research strategies of both psychologists and physiologists to accomplish this goal (as discussed in Carlson, 2013). A developmental psychologist would be interested in how these physiological systems impact development and how these systems grow and change over time.

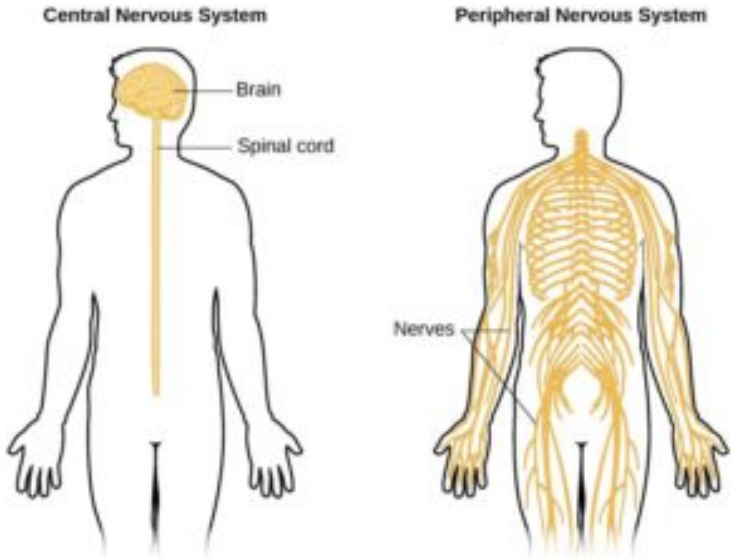

Figure 1. Biological psychologists study how the structure and function of the nervous system generate behavior.

Evolutionary Psychology

While biopsychology typically focuses on the immediate causes of behavior based on the physiology of a human or other animals, evolutionary psychology seeks to study the ultimate biological causes of behavior. To the extent that behavior is impacted by genetics, a behavior, like any anatomical characteristic of a human or animal, will demonstrate adaption to its surroundings. These surroundings include the physical environment, and since interactions between organisms can be critical to survival and reproduction, the social environment. The study of behavior in the context of evolution has its origins with Charles Darwin, the co-discoverer of the theory of evolution by natural selection. Darwin predicted that psychology would develop an evolutionary basis and that a process of natural selection creates traits in a species that are adaptive to its environment. For example, some evolutionary developmental psychologists suggest that behavior such as shyness and jealousy may be produced in part by genetic causes, presumably because they helped increase the survival rates of human's ancient relatives (Buss, 2012; Easton et al., 2007).

Evolutionary psychology has seen a resurgence in recent decades. To be subject to evolution by natural selection, behavior must have a significant genetic cause. In general, we expect all human cultures to express a behavior if it is caused genetically since the genetic differences among human groups are small. The approach taken by most evolutionary psychologists is to predict the outcome of a behavior in a particular situation based on evolutionary theory and then to make observations, or conduct experiments, to determine whether the results match the theory. It is important to recognize that these types of studies are not strong evidence that a behavior

is adaptive since they lack information that the behavior is, in some part, genetic and not entirely cultural (Endler, 1986). Demonstrating that a trait, especially in humans, is naturally selected is extraordinarily challenging; perhaps, for this reason, some evolutionary psychologists are content to assume the behaviors they study have genetic determinants (Confer et al., 2010).

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Video 1. *Evolution and Human Culture* explains how evolutionary theory can be applied to behavior and society.

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Comparing Contemporary Approaches

Developmental theories provide a set of guiding principles that describe, predict, and explain development. Some developmental theories focus on the formation of a particular quality, such as Piaget's theory of cognitive development. Other theories focus on growth that happens throughout the lifespan, such as Erikson's theory of psychosocial development. It would be natural to wonder which of the perspectives provides the most accurate account of human development, but clearly, each perspective is based on its specific premises and focuses on different aspects of development. Many developmentalists use an eclectic approach, drawing on several perspectives at the same time because the same developmental phenomenon can be looked at from several perspectives. In Table 3.10.1, we will review major contemporary approaches that you learned about in this chapter and compare their perspectives on some of the key issues in developmental psychology.

Table 1. Comparison of major contemporary approaches in development

Theory	Major ideas	Continuous or discontinuous development?	One course of development or many?	More natur
Psychodynamic Approach	Behavior is motivated by inner forces, memories, and conflicts, influenced by unconscious mind and early childhood experiences.	Discontinuous; there are distinct stages of development	One course; stages are universal for everyone	Both; impul childh socio exper
Behavioral Approach	Learning by the association of a response with a stimulus; a person comes to respond in a particular way through conditioning	Continuous; learning is ongoing without distinct stages	Many courses; learned behaviors vary by person	Mostl behav condi
Cognitive Approach	People gradually acquire, construct, and use knowledge and information, influencing behavior and development.	Both; stage theories like Piaget are discontinuous & information processing is continuous	One course; stages are universal for everyone	Both; matu with grow
Humanistic Approach	Individual's inherent drive towards self-actualization & contend that people have a natural capacity to make decisions about their lives and control their own behavior.	Continuous; development is ongoing and multidirectional depending on environmental circumstances	Mostly one course; Maslow's hierarchy is universally applied, but self-actualization is individualized	Mostl nurtu is infl envir circu social
Contextual or Sociocultural Approach	Development occurs within a social context as part of a cultural system.	Both, but mostly continuous as an individual learns and progresses	Many courses; there are variations between individuals and cultures	Both; influe by bio prepa social

Biological Approach	Physiological functions, like the central nervous system and hormones, affect behavior and development.	Continuous; constant changes to the body affect changes in development	Both; there are universal milestones for growth, but variations due to environment	Both; a four devel nurtu inhibi
Evolutionary psychology Approach	Identify behavior that is a result of our genetic inheritance from our ancestors.	Continuous; current behaviors have been shaped over multiple generations based on successful survival and reproduction	Both; behavioral genetics show similarities across the species, but our unique family history also plays a role in development	Both; histor impul with l to pro devel devel the hi futur

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Glossary

accommodation: a term developed by psychologist Jean Piaget to describe what occurs when new information or experiences cause you to modify your existing schemas

assimilation: a cognitive process that manages how we take in new information and incorporate that new information into our existing knowledge

behavioral approach: the approach that suggests that the keys to understanding development are observable behavior and outside stimuli in the environment

bioecological model: the perspective suggesting that multiple levels of the environment interact with biological potential to influence development

chronosystem: the environmental events and transitions that occur throughout a child's life, including any socio-historical events

classical conditioning: a type of learning in which an organism responds in a particular way to a neutral stimulus that normally does not bring about that type of response

cognitive approach: an approach that focuses on the process that allows people to know, understand and think about the world

concrete operational stage: the stage in which children can think logically about real (concrete) events, have a firm grasp on the use of numbers and start to employ memory strategies, lasts from about 7 to 11 years old

conservation: the idea that even if you change the appearance of something, it is still equal in size as long as nothing has been removed or added, usually develops during the concrete operational stage

contextual approach: a theory that considers the relationship between individuals and their physical, cognitive, and social worlds

ecological systems theory: Urie Bronfenbrenner's theory stressing the importance of studying a child in the context of

multiple environments, organized into five levels of external influence: microsystem, mesosystem, exosystem, macrosystem, and chronosystem

exosystem: the larger contexts of the community, including the values, history, and economy

evolutionary psychology: a field of study that seeks to identify behavior that is a result of our genetic inheritance from our ancestors

formal operational stage: the fourth, and last, stage in Piaget's theory and lasts from about age 11 to adulthood. Children in the formal operational stage can deal with abstract ideas and hypothetical situations

humanism: a psychological theory that emphasizes an individual's inherent drive towards self-actualization and contends that people have a natural capacity to make decisions about their lives and control their own behavior

hypothesis: a testable prediction

information-processing approach: an alternative to Piagetian approaches, a model that seeks to identify the ways individual take in, use, and store information

law of effect: behavior that is followed by consequences satisfying to the organism will be repeated, and behaviors that are followed by unpleasant consequences will be discouraged

macrosystem: cultural elements such as global economic conditions, war, technological trends, values, philosophies, and a society's responses to the global community which impact a community

Maslow's hierarchy of needs: a motivational theory in psychology comprising a five-tier model of human needs, often depicted as hierarchical levels within a pyramid. Needs lower down in the hierarchy must be satisfied before individuals are motivated to attend to needs higher up

mesosystem: larger organizational structures such as school, the family, or religion

microsystem: immediate surrounds including those who have

direct, significant contact with the person, such as parents or siblings

neurosis: a tendency to experience negative emotions

operant conditioning: a form of learning in which a voluntary response is strengthened or weekend by its association with positive or negative consequences

Piaget theory of cognitive development: a description of cognitive development as four distinct stages in children: sensorimotor, preoperational, concrete, and formal

psychodynamic approach: the perspective that behavior is motivated by inner forces, memories, and conflicts that are generally beyond people's awareness and control

psychosocial theory: the theory that emphasizes that social relationships that are important at each stage of personality development

reciprocal determinism: the interplay between our personality and the way we interpret events and how they influence us

reversibility: objects can be changed and then returned to their original form or condition, typically observed during the concrete operational stage

scaffolding: a process in which adults or capable peers model or demonstrate how to solve a problem, and then step back, offering support as needed

schemas: an existing framework for an object or concept

self-actualization: according to humanistic theory, the realizing of one's full potential can include creative expression, a quest for spiritual enlightenment, the pursuit of knowledge, or the desire to contribute to society. For Maslow, it is a state of self-fulfillment in which people achieve their highest potential in their own unique way

social learning theory: learning by observing the behavior of another person, called a model

sociocultural theory: Vygotsky's theory that emphasizes how cognitive development proceeds as a result of social interactions between members of a culture

theory: a well-developed set of ideas that propose an explanation for observed phenomena that can be used to make predictions about future observations

theory-of-mind (TOM): explains how children come to understand that people have thoughts, feelings, and beliefs that are different from their own, develops during the preoperational stage

zone of proximal development (ZPD): the difference between what a learner can do without help, and what they can do with help

PRENATAL DEVELOPMENT

Learning Objectives

- Describe genetic components of conception
- Describe genes and their importance in genetic inheritance
- Describe chromosomal abnormalities
- Explain the value of prenatal testing
- Describe the interaction between genetics and the environment
- Compare monozygotic and dizygotic twins
- Differentiate between development during the germinal, embryonic, and fetal periods
- Examine risks to prenatal development posed by exposure to teratogens
- Explain potential complications of pregnancy and delivery
- Describe various approaches to childbirth
- Describe a normal delivery, including the stages of childbirth
- Examine risks and complications with newborns

People endure quite an incredible journey before they are born. Think about it—when the timing and conditions are just right, a tiny egg releases from ovulation and a single sperm out of hundreds of millions unite to begin the process of fertilization. Genetic material from the mother and father join together to form a completely new organism. This new organism has to continue to travel and implant

in the uterine wall in order to continue to grow and thrive. It is not an easy feat. It still must grow and develop for approximately 268 days before it begins life outside of the womb.

Today we have more knowledge and technology than ever before that has an impact on this process. We are privy to tests that can give us a wealth of information even before we conceive. We have the ability to know the genetic make-up of a prenate before it is implanted in the womb. New parents have the choice of the prenatal care that they receive and how they want to prepare for labor and delivery. As you will see, the choices that are made along the way and the unforeseen surprises make for a unique pregnancy and birth story.

This chapter explores this journey and the development process from the moment of conception to delivery.

Watch It

Video 1. *Conception to Birth* shows fascinating animation of a prenate growing and developing inside of the womb.

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Biological Foundations of Human Development

In this section, we will look at some of the ways in which heredity helps to shape the way we are. Heredity involves more than genetic information from our parents. According to evolutionary psychology, our genetic inheritance comes from the most adaptive genes of our ancestors. We will look at what happens genetically during conception and take a brief look at some genetic abnormalities. Before going into these topics, however, it is important to emphasize the interplay between heredity and the environment. Why are you the way you are? As you consider some of your features (height, weight, personality, health, etc.), ask yourself whether these features are a result of heredity, or environmental factors, or both. Chances are, you can see the ways in which both heredity and environmental factors (such as lifestyle, diet, and so on) have contributed to these features.

Evolutionary Psychology

Figure 1. *Evolutionary psychology examines the connection between biological adaptation and preferences in mate selection.*

Evolutionary psychology focuses on how universal patterns of behavior and cognitive processes have evolved over time. Variations in cognition and behavior would make individuals more or less successful in reproducing and passing those genes to their offspring. Evolutionary psychologists study a variety of psychological phenomena that may have evolved as adaptations, including the fear response, food preferences, mate selection, and cooperative behaviors (Confer et al., 2010).

Many think of evolution as the development of traits and behaviors that allow us to survive this "dog-eat-dog" world, like strong leg muscles to run fast, or fists to punch and defend ourselves. However, physical survival is only important if it eventually contributes to successful reproduction. That is, even if you live to be 100 years old, if you fail to mate and produce children, your genes will die with your body. Thus, *reproductive* success, not *survival* success, is the engine of evolution by natural selection.

Charles Darwin describes this process in the **theory of evolution by natural selection**. In simple terms, the theory states that organisms that are better suited for their environment will survive and reproduce, while those that are poorly suited for their environment will die off. There is a growing interest in applying the principles of evolutionary psychology to better understand lifespan development in humans.

Lifespan Development and Evolutionary

Psychology

As we consider development from conception through the lifespan, there will be many opportunities to understand how evolutionary psychology enhances our understanding of development. For instance, women and men do differ in their preferences for a few key qualities in long-term mating, because of somewhat distinct adaptive concerns. Modern women have inherited the evolutionary trait to desire mates who possess resources, have qualities linked with acquiring resources (e.g., ambition, wealth, industriousness), and are willing to share those resources with them. On the other hand, men more strongly desire youth and health in women, as both are cues to fertility. These male and female differences have historically been universal in humans.

Just because a psychological adaptation was advantageous in our history, doesn't mean it's still useful today. For example, even though women may have preferred men with resources in previous generations, our modern society has advanced such that these preferences are no longer necessary. Nonetheless, it's important to consider how our evolutionary history has shaped our automatic or "instinctual" desires and reflexes of today so that we can better shape them for the future ahead.

As we follow the journey of life, from conception to death, think about how the theory of natural selection and the concepts of evolutionary psychology can enlighten our understanding of why some automatic reflexes or instinctual desires are more common than others. Remember that the end product of the theory of evolution by natural selection is successful survival and reproduction. Can you think of some ways that the ultimate goal of reproductive success affects our selection of a mate, how we parent young children, why we are motivated to achieve certain goals, or what differentiates families with traditionally longer lifespans? In order to achieve reproductive success, the theory of evolution by natural selection states that organisms should be suited to their

environment. Think about how different environments or cultures require different traits for successful survival and reproduction. Can you think of some ways that we may be changing to be better suited to our changing culture?

Link to Learning

David Buss is one of the leading researchers in evolutionary psychology. In David Buss' Ted Talk, he explains several theories related to the selection of sexual partners, mating preferences, and infidelity.

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Heredity and Chromosomes

Heredity is the passing on of traits from parents to their offspring. For humans, through sexual reproduction, the offspring acquire the genetic information of their parents. Through heredity, variations between individuals can accumulate and cause species to evolve by natural selection.

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Video 1. *Heritability* explained.

Gametes

There are two types of sex cells or **gametes** involved in reproduction: the male gametes, or sperm, and female gametes, or ova. The male gametes are produced in the testes through a process called spermatogenesis, which begins at about 12 years of age. The female gametes, which are stored in the ovaries, are present at birth but are immature. Each ovary contains about 250,000 ova but only about 400 of these will become mature eggs (Mackon & Fauser, 2000; Rome, 1998). Beginning at puberty, one ovum ripens and is released about every 28 days, a process called oogenesis.

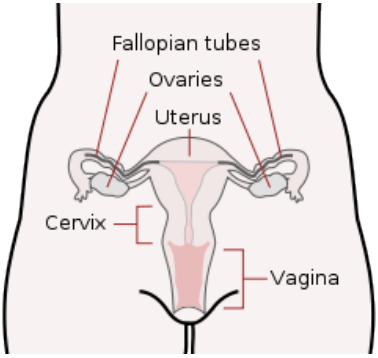

Figure 4.3.1. *The Female Reproductive System.*

After the ovum or egg ripens and is released from the ovary, it is drawn into the fallopian tube and in 3 to 4 days, reaches the uterus. It is typically fertilized in the fallopian tube and continues its journey to the uterus. At ejaculation, millions of sperm are released into the vagina, but only a few reach the egg and typically, only one fertilizes the egg. Once a single sperm has entered the wall of the egg, the wall becomes hard and prevents other sperm from entering. After the sperm has entered the egg, the tail of the sperm breaks off and the head of the sperm, containing the genetic information from the father, unites with the nucleus of the egg. As a result, a new cell is formed. This cell, containing the combined genetic information from both parents, is referred to as a zygote.

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Video 2. *Fertilization* shows how one single sperm survives the long and treacherous journey to fertilize the mother's egg.

Chromosomes

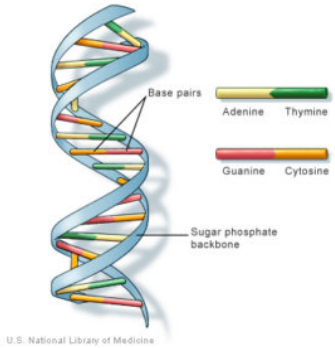

Figure 2. *Deoxyribonucleic acid (DNA) is a helix-shaped molecule made up of nucleotide base pairs. Sequences of DNA make up genes.*

While other normal human cells have 46 chromosomes (or 23 pairs), gametes contain 23 chromosomes. **Chromosomes** are long threadlike structures found in a cell nucleus that contains genetic material known as **deoxyribonucleic acid (DNA)**. DNA is a helix-shaped molecule made up of nucleotide base pairs [adenine (A), guanine (G), cytosine (C), and thymine (T)]. In each chromosome, sequences of DNA make up **genes** that control or partially control a number of visible characteristics, known as traits, such as eye color, hair color, and so on. A single gene may have multiple possible variations or alleles. An **allele** is a specific version of a gene. So, a given gene may code for the trait of hair color, and the different alleles of that gene affect which hair color an individual has.

In a process called meiosis, segments of the chromosomes from each parent form pairs, and genetic segments are exchanged as determined by chance. Because of the unpredictability of this exchange, the likelihood of having offspring that are genetically identical (and not twins) is one in trillions (Gould & Keeton, 1997). Genetic variation is important because it allows a species to adapt so that those who are better suited to the environment will survive and reproduce, which is an important factor in natural selection.

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Video 3. *Meiosis* explained.

Genotypes and Phenotypes

When a sperm and egg fuse, their 23 chromosomes pair up and create a zygote with 23 pairs of chromosomes. Therefore, each parent contributes half the genetic information carried by the offspring; the resulting physical characteristics of the offspring (called the phenotype) are determined by the interaction of genetic material supplied by the parents (called the genotype). A person's **genotype** is the genetic makeup of that individual. **Phenotype,** on the other hand, refers to the individual's inherited physical characteristics.

Look in the mirror. What do you see, your genotype or your

phenotype? What determines whether or not genes are expressed? Actually, this is quite complicated. Some features follow the additive pattern which means that many different genes contribute to a final outcome. Height and skin tone are examples. In other cases, a gene might either be turned on or off depending on several factors, including the gene with which it is paired or the inherited epigenetic tags.

Determining the Sex of the Child

Twenty-two of those chromosomes from each parent are similar in length to a corresponding chromosome from the other parent. However, the remaining chromosome looks like an X or a Y. Half of the male's sperm contains a Y chromosome and half contain an X. All of the ova contain X chromosomes. If the child receives the combination of XY, the child will be genetically male. If it receives the XX combination, the child will be genetically female.

Many potential parents have a clear preference for having a boy or a girl and would like to determine the sex of the child. Through the years, a number of tips have been offered for potential parents to maximize their chances of having either a son or daughter as they prefer. For example, it has been suggested that sperm that carry a Y chromosome are more fragile than those carrying an X. So, if a couple desires a male child, they can take measures to maximize the chance that the Y sperm reaches the egg. This involves having intercourse 48 hours after ovulation, which helps the Y sperm have a shorter journey to reach the egg, douching to create a more alkaline environment in the vagina, and having the female reach orgasm first so that sperm are not pushed out of the vagina during orgasm. Today, however, there is new technology available that makes it possible to isolate sperm containing either an X or a Y, depending on the preference, and use that sperm to fertilize a mother's egg.

Genetic Variation and Inheritance

Genetic variation, the genetic difference between individuals, is what contributes to a species' adaptation to its environment. In humans, genetic variation begins with an egg, several million sperm, and fertilization. The egg and the sperm each contain 23 chromosomes, which make up our genes. A single gene may have multiple possible variations or alleles (a specific version of a gene), resulting in a variety of combinations of inherited traits.

Genetic inheritance of traits for humans is based upon Gregor Mendel's model of inheritance. For genes on an autosome (any chromosome other than a sex chromosome), the alleles and their associated traits are autosomal dominant or autosomal recessive. In this model, some genes are considered dominant because they will be expressed. Others, termed recessive, are only expressed in the absence of a dominant gene. Some characteristics which were once thought of as dominant-recessive, such as eye color, are now believed to be a result of the interaction between several genes (McKusick, 1998). Dominant traits include curly hair, facial dimples, normal vision, and dark hair. Recessive characteristics include red hair, pattern baldness, and nearsightedness.

DOMINANT AND RECESSIVE CHARACTERISTICS

Table 1. Characteristics in the left-hand column dominate over those characteristics listed in the right-hand column.

	DOMINANT TRAITS
eye coloring	brown eyes
vision	farsightedness normal vision normal vision normal vision
hair	dark hair non-red hair curly hair full head of hair widow's peak
facial features	dimples unattached earlobes freckles broad lips
appendages	extra digits fused digits short digits fingers lack 1 joint limb dwarfing clubbed thumb double-jointedness
other	immunity to poison ivy normal pigmented skin normal blood clotting normal hearing normal hearing and speaking normal- no PKU

Sickle cell anemia is an autosomal recessive disease; Huntington's disease is an autosomal dominant disease. Other traits are a result of partial dominance or co-dominance in which both genes are influential. For example, if a person inherits both recessive genes for cystic fibrosis, the disease will occur. But if a person has only one recessive gene for the disease, the person would be a carrier of the disease.

In this example, we will call the normal gene "N," and the gene for cystic fibrosis "c." The normal gene is dominant, which means

that having the dominant allele either from one parent (Nc) or both parents (NN) will always result in the phenotype associated with the dominant allele. When someone has two copies of the same allele, they are said to be **homozygous** for that allele. When someone has a combination of alleles for a given gene, they are said to be **heterozygous**. For example, cystic fibrosis is a recessive disease which means that an individual will only have the disease if they are homozygous for that recessive allele (cc).

Imagine that a woman who is a carrier of the cystic fibrosis gene has a child with a man who also is a carrier of the same disease. What are the odds that their child would inherit the disease? Both the woman and the man are heterozygous for this gene (Nc). We can expect the offspring to have a 25% chance of having cystic fibrosis (cc), a 50% chance of being a carrier of the disease (Nc), and a 25% chance of receiving two normal copies of the gene (NN).

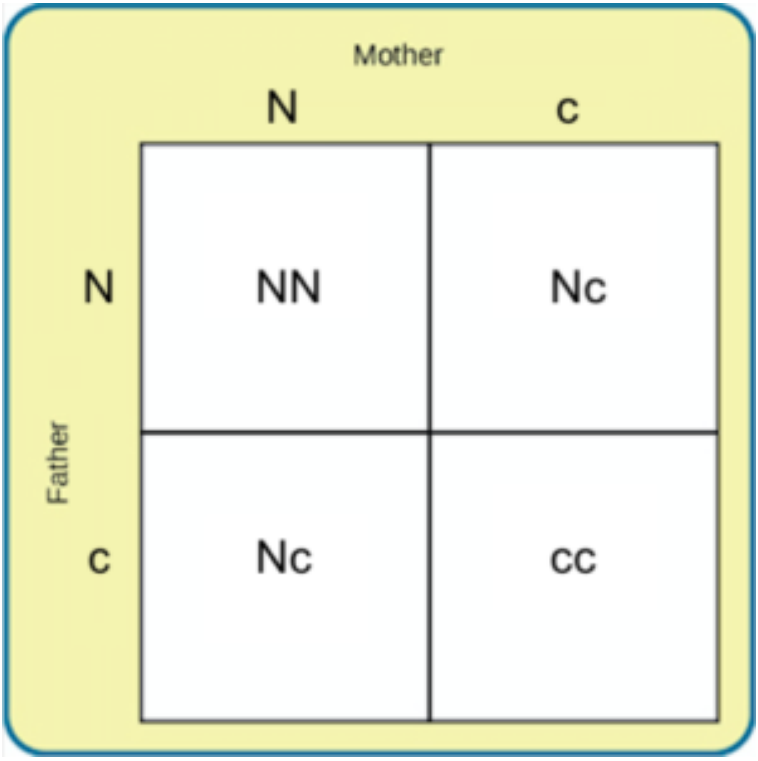

Figure 3. *A Punnett square is a tool used to predict how genes will interact in the production of offspring. The capital N represents the dominant allele, and the lowercase c represents the recessive allele. In the example of cystic fibrosis, where N is the normal gene (dominant allele), wherever a pair contains the dominant allele, N, you can expect a phenotype that does not express the disease. You can expect a cystic fibrosis phenotype only when there are two copies of the c (recessive allele) which contains the gene mutation that causes the disease.*

Where do harmful genes that contribute to diseases like cystic fibrosis come from? Gene mutations provide one source of harmful genes. A **mutation** is a sudden, permanent change in a gene. While many mutations can be harmful or lethal, once in a while a mutation benefits an individual by giving that person an advantage over those who do not have the mutation. Recall that the theory of evolution

asserts that individuals best adapted to their particular environments are more likely to reproduce and pass on their genes to future generations. In order for this process to occur, there must be competition—more technically, there must be variability in genes (and resultant traits) that allow for variation in adaptability to the environment. If a population consisted of identical individuals, then any dramatic changes in the environment would affect everyone in the same way, and there would be no variation in selection. In contrast, diversity in genes and associated traits allow some individuals to perform slightly better than others when faced with environmental change. This creates a distinct advantage for individuals best suited for their environments in terms of successful reproduction and genetic transmission.

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Video 4. *An Introduction to Mendelian Genetics* demonstrates another example of the interaction of alleles using the Punnett square.

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Sex-Linked Traits

Sex-linked traits are genes located on a sex chromosome (the 23rd pair). In humans, the term generally refers to traits that are influenced by genes on the X chromosome. This is because the X chromosome is large and contains many more genes than the smaller Y chromosome. In a sex-linked disease, it is usually males who are affected because they have a single copy of the X chromosome that carries the mutation. In females, the effect of the mutation may be masked by the second healthy copy of the X chromosome.

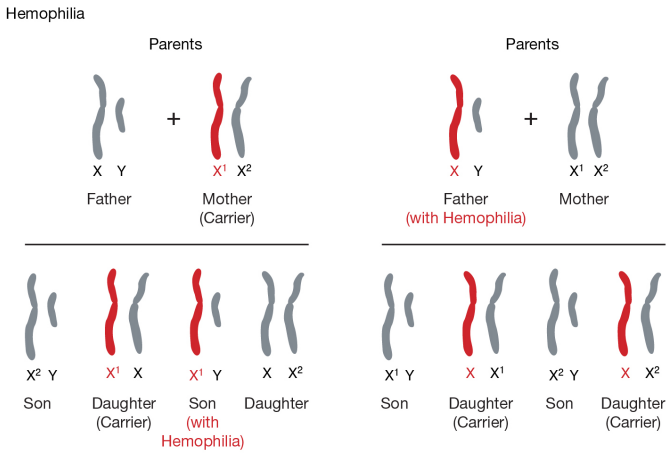

Figure 4. Hemophilia is an example of a sex-linked trait, as are color blindness, congenital night blindness, some high blood pressure genes, Duchenne muscular dystrophy, and also Fragile X syndrome. This exemplifies how the gene for hemophilia may be passed from one parent to their sons and daughters.

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Video 5. *Sex-Linked Traits* explains the traits carried on the 23rd pair of chromosomes and how these

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Chromosomal Abnormalities and Genetic Testing

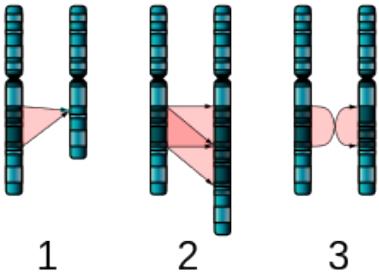

Figure 5. *The three major single-chromosome mutations: deletion (1), duplication (2), and inversion (3).*

A chromosomal abnormality occurs when a child inherits too many or too few chromosomes. The most common cause of chromosomal abnormalities is the age of the mother. A 20-year-old woman has a 1 in 800 chance of having a child with a common chromosomal abnormality. A woman of 44, however, has a one in 16 chance. It is believed that the problem occurs when the ovum is ripening prior to ovulation each month. As the mother ages, the ovum is more likely to suffer abnormalities at this time.

Another common cause of chromosomal abnormalities occurs because the gametes do not divide evenly when they are forming. Therefore, some cells have more than 46 chromosomes. In fact, it is believed that close to half of all zygotes have an odd number of chromosomes. Most of these zygotes fail to develop and are spontaneously aborted by the body. If the abnormal number occurs on pair # 21 or # 23, however, the individual may have certain physical or other abnormalities.

An altered chromosome structure may take several different forms, and result in various disorders or malignancies:

- *Deletions*: A portion of the chromosome is missing or deleted. Known disorders in humans include Wolf-Hirschhorn syndrome, which is caused by partial deletion of the short arm of chromosome 4; and Jacobsen syndrome, also called the terminal 11q deletion disorder.

- *Duplications*: A portion of the chromosome is duplicated, resulting in extra genetic material. Known human disorders include Charcot-Marie-Tooth disease type 1A, which may be caused by duplication of the gene encoding peripheral myelin protein 22 (PMP22) on chromosome 17.
- *Translocations*: A portion of one chromosome is transferred to another chromosome. There are two main types of translocations:
    - *Reciprocal translocation*: Segments from two different chromosomes have been exchanged.
    - *Robertsonian translocation*: An entire chromosome has attached to another at the centromere – in humans, these only occur with chromosomes 13, 14, 15, 21, and 22.

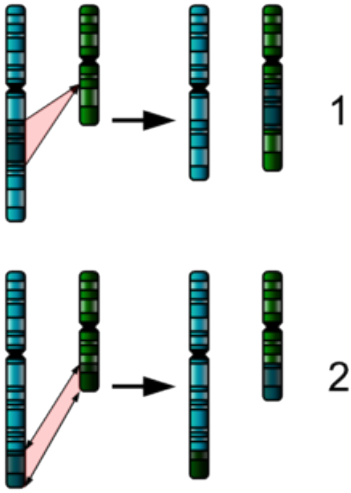

Figure 6. *The two major two-chromosome mutations: insertion (1) and Translocation (2).*

- *Inversions*: A portion of the chromosome has broken off, turned upside down, and reattached, therefore the genetic material is inverted.
- *Insertions*: A portion of one chromosome has been deleted from its normal place and inserted into another chromosome.
- *Rings*: A portion of a chromosome has broken off and formed a circle or ring. This can happen with or without loss of genetic material.
- *Isochromosome*: Formed by the mirror image copy of a chromosome segment including the centromere.

One of the most common chromosomal abnormalities is on pair

21. Trisomy 21 occurs when there are three rather than two chromosomes on #21. A person with Down syndrome has distinct facial features, intellectual disability, and oftentimes heart and gastrointestinal disorders. Symptoms vary from person to person and can range from mild to severe. With early intervention, the life expectancy of persons with Down syndrome has increased in recent years. Keep in mind that there is as much variation in people with Down Syndrome as in most populations and those differences need to be recognized and appreciated.

Watch It

Video 6. *Down Syndrome* ability awareness from the National Down Syndrome Society.

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When the chromosomal abnormality is on pair #23, the result is a sex-linked chromosomal abnormality. A person might have XXY, XYY, XXX, XO, or 45 or 47 chromosomes as a result. Two of the more common sex-linked chromosomal disorders are Turner syndrome and Klinefelter syndrome. Turner's syndrome occurs in 1 of every 2,500 live female births (Carroll, 2007) when an ovum

that lacks a chromosome is fertilized by a sperm with an X chromosome. The resulting zygote has an XO composition. Fertilization by a Y sperm is not viable. Turner syndrome affects cognitive functioning and sexual maturation. The external genitalia appears normal, but breasts and ovaries do not develop fully and the woman does not menstruate. Turner's syndrome also results in short stature and other physical characteristics. Klinefelter syndrome (XXY) occurs in 1 out of 700 live male births and results when an ovum containing an extra X chromosome is fertilized by a Y sperm. The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development. An individual with Klinefelter syndrome has some breast development, infertility (this is the most common cause of infertility in males), and has low levels of testosterone.

Prenatal Testing

Prenatal testing consists of prenatal screening and prenatal diagnosis, which are aspects of prenatal care that focus on detecting problems with the pregnancy as early as possible. These may be anatomic and physiologic problems with the health of the zygote, embryo, or fetus, either before gestation even starts or as early in gestation as practical. **Prenatal screening** focuses on finding problems among a large population with affordable and noninvasive methods. The most common screening procedures are routine ultrasounds, blood tests, and blood pressure measurement. **Prenatal diagnosis** focuses on pursuing additional detailed information once a particular problem has been found, and can sometimes be more invasive.

Screening can detect problems such as neural tube defects, anatomical defects, chromosome abnormalities, and gene mutations that would lead to genetic disorders and birth

defects, such as spina bifida, cleft palate, Downs Syndrome, Tay–Sachs disease, sickle cell anemia, thalassemia, cystic fibrosis, muscular dystrophy, and fragile X syndrome. Some tests are designed to discover problems that primarily affect the health of the mother, such as PAPP-A to detect pre-eclampsia or glucose tolerance tests to diagnose gestational diabetes. Screening can also detect anatomical defects such as hydrocephalus, anencephaly, heart defects, and amniotic band syndrome.

Common prenatal diagnosis procedures include amniocentesis and chorionic villus sampling. Because of the miscarriage and fetal damage risks associated with amniocentesis and CVS procedures, many women prefer to first undergo screening so they can find out if the fetus' risk of birth defects is high enough to justify the risks of invasive testing. Screening tests yield a risk score which represents the chance that the baby has the birth defect; the most common threshold for high-risk is 1:270. A risk score of 1:300 would, therefore, be considered low-risk by many physicians. However, the trade-off between the risk of birth defects and risk of complications from invasive testing is relative and subjective; some parents may decide that even a 1:1000 risk of birth defects warrant an invasive test while others wouldn't opt for an invasive test even if they had a 1:10 risk score.

There are three main purposes of prenatal diagnosis: (1) to enable timely medical or surgical treatment of a condition before or after birth, (2) to give the parents the chance to abort a fetus with the diagnosed condition, and (3) to give parents the chance to prepare psychologically, socially, financially, and medically for a baby with a health problem or disability, or for the likelihood of stillbirth. Having this information in advance of birth means that healthcare staff, as well as parents, can better prepare themselves for the delivery of a child with a health problem. For example, Down Syndrome is associated with cardiac defects that may need intervention immediately upon birth.

The American College of Obstetricians and Gynecologists (ACOG) guidelines currently recommend that all pregnant women,

regardless of age, be offered invasive testing to obtain a definitive diagnosis of certain birth defects. Therefore, most physicians offer diagnostic testing to all their patients, with or without prior screening, and let the patient decide.

watch it

Video 7. *Screening in Pregnancy* provides more information about prenatal testing and screening during pregnancy.

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Behavioral Genetics

Behavioral geneticists study how individual differences arise, in the present, through the interaction of genes and the environment. When studying human behavior, behavioral geneticists often employ twin and adoption studies to research questions of interest. Twin studies compare the rates that a given behavioral trait is shared among identical and fraternal twins; adoption studies compare those rates among biologically related relatives and adopted relatives. Both approaches provide some insight into the relative importance of genes and environment for the expression of a given trait.

Nature or Nurture?

For decades, scholars have carried on the "nature/nurture" debate. For any particular feature, those on the "nature" side would argue that heredity plays the most important role in bringing about that feature. Those on the "nurture" side would argue that one's environment is most significant in shaping the way we are. This debate continues in questions about what makes us masculine or feminine (Lippa, 2002), concerns about vision (Mutti, Kadnik, & Adams, 1996), and many other developmental issues.

Most scholars agree that there is a constant interplay between the two forces. It is difficult to isolate the root of any single behavior as a result solely of nature or nurture, and most scholars believe that even determining the extent to which nature or nurture impacts a human feature is difficult to answer. In fact, almost all human features are polygenic (a result of many genes) and multifactorial (a result of many factors, both genetic and environmental). It is as if one's genetic make-up sets up a range of possibilities, which may or may not be realized depending upon one's environmental

experiences. For instance, a person might be genetically predisposed to develop diabetes, but the person's lifestyle may help bring about the disease.

When you think about your own family history, it is easy to see that there are certain personality traits, behavioral characteristics, and medical conditions that are more common than others. This is the reason that doctors ask you about your family medical history. While genetic predisposition is important to consider, there are some family members who, for a variety of reasons, seemed to defy the odds of developing these conditions. These differences can be explained in part by the effect of **epigenetic** (above the genome) changes.

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Video 1. *Epigenetics* explains some of the research that gives insights into the complicated relationship between nature and nurture.

The Epigenetic Framework

The term "epigenetic" has been used in developmental psychology to describe psychological development as the result of an ongoing, bi-directional interchange between heredity and the environment. Gottlieb (1998; 2000; 2002) suggests an analytic framework for the nature/nurture debate that recognizes the

interplay between the environment, behavior, and genetic expression. This bidirectional interplay suggests that the environment can affect the expression of genes just as genetic predispositions can impact a person's potentials. Likewise, environmental circumstances can trigger symptoms of a genetic disorder. For example, a person predisposed genetically for type 2 diabetes may trigger the disease through poor diet and little exercise.

The developmental psychologist Erik Erikson wrote of an *epigenetic principle* in his book *Identity: Youth and Crisis* (1968), encompassing the notion that we develop through an unfolding of our personality in predetermined stages, and that our environment and surrounding culture influence how we progress through these stages. This biological unfolding in relation to our socio-cultural settings is done in stages of psychosocial development, where "progress through each stage is in part determined by our success, or lack of success, in all the previous stages."

In typical human families, children's biological parents raise them, so it is very difficult to know whether children act like their parents due to genetic (nature) or environmental (nurture) reasons. Nevertheless, despite our restrictions on setting up human-based experiments, we do see real-world examples of nature-nurture at work in the human sphere—though they only provide partial answers to our many questions. The science of how genes and environments work together to influence behavior is called **behavioral genetics**. The easiest opportunity we have to observe this is the **adoption study**. When children are put up for adoption, the parents who give birth to them are no longer the parents who raise them. Children aren't assigned to random adoptive parents in order to suit the particular interests of a scientist but adoption still tells us some interesting things, or at least confirms some basic expectations. For instance, if the biological child of tall parents were adopted into a family of short people, do you suppose the child's growth would be affected? What about the biological child of a Spanish-speaking family adopted at

birth into an English-speaking family? What language would you expect the child to speak? And what might these outcomes tell you about the difference between height and language in terms of nature-nurture?

Monozygotic and Dizygotic Twins

Another option for observing nature-nurture in humans involves **twin studies**. To analyze nature–nurture using twins, we compare the similarity of monozygotic and dizygotic pairs. **Monozygotic** twins occur when a single zygote or fertilized egg splits apart in the first two weeks of development. The result is the creation of two separate but genetically identical offspring. About one-third of twins are monozygotic twins. Monozygotic twins occur in birthing at a rate of about 3 in every 1000 deliveries worldwide (about 0.3% of the world population). Monozygotic twins are genetically nearly identical and they are always the same sex unless there has been a mutation during development. The children of monozygotic twins test genetically as half-siblings (or full siblings, if a pair of monozygotic twins reproduces with another pair of identical twins or with the same person), rather than first cousins.

Sometimes two eggs or ova are released and fertilized by two separate sperm. The result is **dizygotic** or fraternal twins. About two-thirds of twins are dizygotic. These two individuals share the same amount of genetic material as would any two children from the same mother and father. Older mothers are more likely to have dizygotic twins than are younger mothers and couples who use fertility drugs are also more likely to give birth to dizygotic twins. Consequently, there has been an increase in the number of fraternal twins in recent years (Bortolus et al., 1999). In vitro fertilization (IVF) techniques are more likely to create dizygotic twins. For IVF deliveries, there are nearly 21 pairs of twins for every 1,000.

In the uterus, a majority of monozygotic twins (60–70%) share the same placenta but have separate amniotic sacs. The **placenta** is a temporary organ that connects the developing fetus via the umbilical cord to the uterine wall to allow nutrient uptake, thermo-regulation, waste elimination, and gas exchange via the mother's blood supply. The **amniotic sac** (also called the bag of waters or the membranes), is a thin but tough transparent pair of membranes that hold a developing embryo (and later fetus) until shortly before birth. In 18–30% of monozygotic twins, each fetus has a separate placenta and a separate amniotic sac. A small number (1–2%) of monozygotic twins share the same placenta and amniotic sac. Fraternal twins each have their own placenta and own amniotic sac.

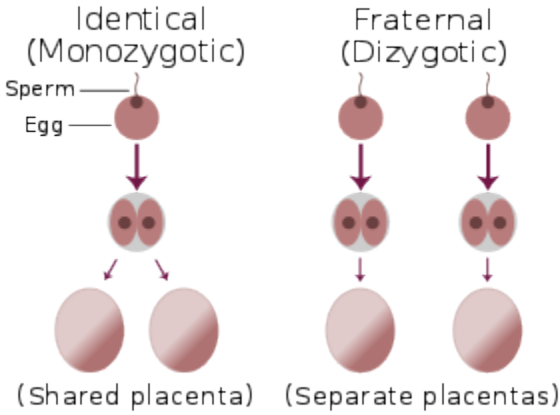

Figure 1. *Monozygotic twins come from a single zygote and generally share the same placenta, although some (18-30%) have separate placentas. Dizygotic twins come from two separately fertilized eggs and have their own placentas and amniotic sacs.*

Monozygotic (one egg/identical) twins can be categorized into four types depending on the timing of the separation and duplication of cells. Various types of chorionicity and amniosity (how the baby's

sac looks) in monozygotic twins are a result of when the fertilized egg divides. This is known as placentation.

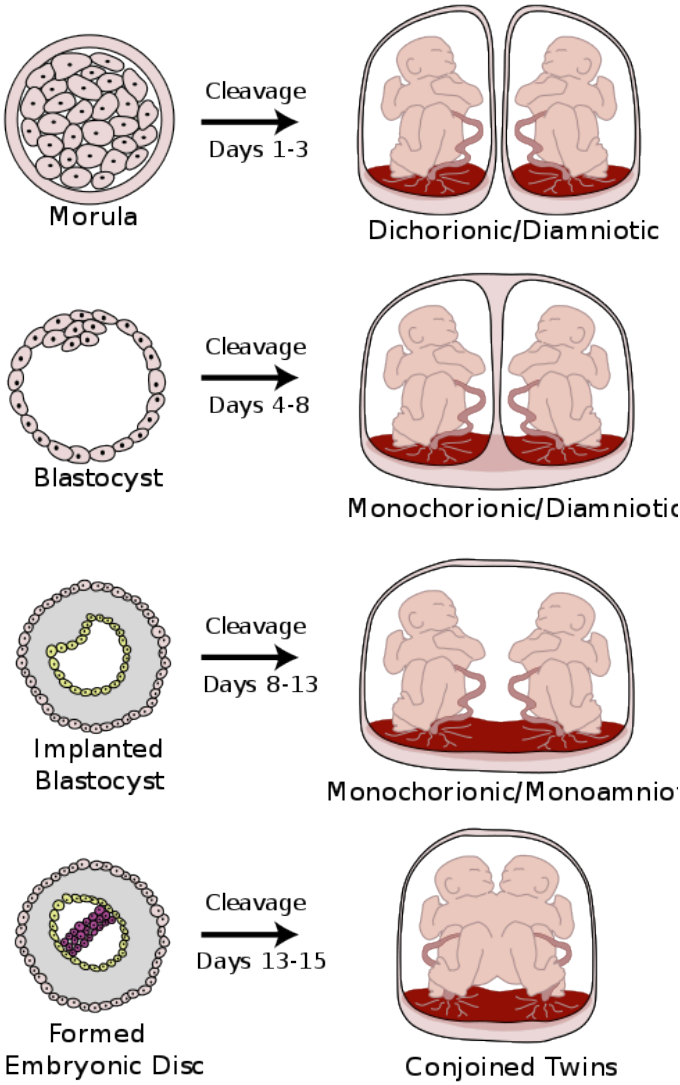

Figure 2. *Various types of chorionicity and amniosity (how the baby's sac looks) in monozygotic (one egg/identical) twins as a result of when the fertilized egg divides (Author Kevin Dufenbach)*

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Conjoined twins

Conjoined twins are monozygotic twins whose bodies are joined together during pregnancy. This occurs when the zygote starts to split after day 12 following fertilization and fails to separate completely. This condition occurs in about 1 in 50,000 human pregnancies. Most conjoined twins are now evaluated for surgery to attempt to separate them into separate functional bodies. The degree of difficulty rises if a vital organ or structure is shared between twins, such as the brain, heart, or liver.

Vanishing twins

Researchers suspect that as many as 1 in 8 pregnancies start out as multiples, but only a single fetus is brought to full term because the other fetus has died very early in the pregnancy and has not been detected or recorded. Early obstetric ultrasonography exams sometimes reveal an "extra" fetus, which fails to develop and instead disintegrates and vanishes in the uterus. There are several reasons for the "vanishing" fetus, including it being embodied or absorbed by the other fetus, placenta or the mother. This is known as vanishing twin syndrome. Also, in an unknown proportion of cases, two

zygotes may fuse soon after fertilization, resulting in a single chimeric embryo, and, later, fetus.

Twin Studies

Using the features of height and spoken language as examples, let's take a look at how nature and nurture apply: identical twins, unsurprisingly, are almost perfectly similar for height. The heights of fraternal twins, however, are like any other sibling pairs: more similar to each other than to people from other families, but hardly identical. This contrast between twin types gives us a clue about the role genetics plays in determining height.

Now consider spoken language. If one identical twin speaks Spanish at home, the co-twin with whom she is raised almost certainly does too. But the same would be true for a pair of fraternal twins raised together. In terms of spoken language, fraternal twins are just as similar as identical twins, so it appears that the genetic match of identical twins doesn't make much difference.

Figure 3. *Identical twins Laurent and Larry Nicolas Bourgeois, also known as the Les Twins, are internationally renowned dancers.*

Twin and adoption studies are two instances of a much broader class of methods for observing nature-nurture called **quantitative genetics**, the scientific discipline in which similarities among individuals are analyzed based on how biologically related they are. We can do these studies with siblings and half-siblings, cousins, and twins who have been separated at birth and raised separately (Bouchard, Lykken, McGue, & Segal, 1990). Such twins are very rare and play a smaller role than is commonly believed in the science of

nature–nurture, or with entire extended families (Plomin, DeFries, Knopik, & Neiderhiser, 2012).

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Video 2. *Twin Studies and Adoption Studies* explains the use of twin and adopted siblings to understand behavioral genetics.

It would be satisfying to be able to say that nature–nurture studies have given us conclusive and complete evidence about where traits come from, with some traits clearly resulting from genetics and others almost entirely from environmental factors, such as child-rearing practices and personal will; but that is not the case. Instead, *everything* has turned out to have some footing in genetics. The more genetically-related people are, the more similar they are—for *everything*: height, weight, intelligence, personality, mental illness, etc. Sure, it seems like common sense that some traits have a genetic bias. For example, adopted children resemble their biological parents even if they have never met them, and identical twins are more similar to each other than are fraternal twins. And while certain psychological traits, such as personality or mental illness (e.g., schizophrenia), seem reasonably influenced by genetics, it turns out that the same is true for political attitudes, how much television people watch (Plomin, Corley, DeFries, & Fulker, 1990), and whether or not they get divorced (McGue & Lykken, 1992).

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Stages of Prenatal Development

How did you come to be who you are? From beginning as a one-cell structure to your birth, your prenatal development occurred in an orderly and delicate sequence. There are three stages of prenatal development: germinal, embryonic, and fetal. Keep in mind that this is different than the three trimesters of pregnancy. Let's take a look at what happens to the developing baby in each of these stages.

> "The body of the unborn baby is more complex than ours. The preborn baby has several extra parts to his body which he needs only so long as he lives inside his mother. He has his own space capsule, the amniotic sac. He has his own lifeline, the umbilical cord, and he has his own root system, the placenta. These all belong to the baby himself, not to his mother. They are all developed from his original cell."
>
> Day & Liley, The Secret World of a Baby, Random House, 1968, p. 13

Let's take a look at some of the changes that take place during each of the three periods of prenatal development: the germinal period, the embryonic period, and the fetal period.

The Germinal Period (Weeks 1-2)

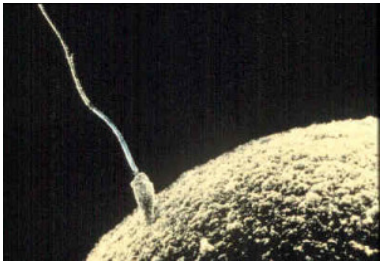

Figure 1. *Sperm and Ovum at Conception*

Conception occurs when a sperm fertilizes an egg and forms a **zygote,** which begins as a one-cell structure. The mother and father's DNA is passed on to the child at the moment of conception. The genetic makeup and sex of the baby are set at this point. The germinal period (about 14 days in length) lasts from conception to implantation of the zygote (fertilized egg) in the lining of the uterus.

During the first week after conception, the zygote divides and multiplies, going from a one-cell structure to two cells, then four cells, then eight cells, and so on. The process of cell division is called **mitosis**. After the fourth division, differentiation of the cells begins to occur as well. Differentiated cells become more specialized, forming different organs and body parts. After 5 days of mitosis, there are 100 cells, and after 9 months there are billions of cells. Mitosis is a fragile process, and fewer than one-half of all zygotes survive beyond the first two weeks (Hall, 2004).

After the zygote divides for about 7–10 days and has 150 cells, it travels down the fallopian tubes and implants itself in the lining of the uterus. It's estimated that about 60 percent of natural conceptions fail to implant in the uterus. The rate is higher for in vitro conceptions. Once the zygote attaches to the uterus, the next stage begins.

The Embryonic Period (Weeks 3-8)

Figure 2. *Human Embryo*

The embryonic period begins once the zygote is implanted in the uterine wall. It lasts from the third through the eighth week after conception. Upon implantation, this multi-cellular organism is called an **embryo**. Now blood vessels grow, forming the placenta. The **placenta** is a structure connected to the uterus that provides nourishment and oxygen from the mother to the developing embryo via the umbilical cord.

During this period, cells continue to differentiate. Basic structures of the embryo start to develop into areas that will become the head, chest, and abdomen. During the embryonic stage, the heart begins to beat and organs form and begin to function. At 22 days after conception, the neural tube forms along the back of the embryo, developing into the spinal cord and brain.

Growth during prenatal development occurs in two major directions: from head to tail (cephalocaudal development) and from the midline outward (proximodistal development). This means that those structures nearest the head develop before those nearest the feet and those structures nearest the torso develop before those away from the center of the body (such as hands and fingers).

The head develops in the fourth week and the precursor to the heart begins to pulse. In the early stages of the embryonic period, gills and a tail are apparent. But by the end of this stage, they

disappear and the organism takes on a more human appearance. The embryo is approximately 1 inch in length and weighs about 4 grams at the end of this period. The embryo can move and respond to touch at this time.

About 20 percent of organisms fail during the embryonic period, usually due to gross chromosomal abnormalities. As in the case of the germinal period, often the mother does not yet know that she is pregnant. It is during this stage that the major structures of the body are taking form making the embryonic period the time when the organism is most vulnerable to the greatest amount of damage if exposed to harmful substances. Potential mothers are not often aware of the risks they introduce to the developing child during this time.

The Fetal Period (Weeks 9-40)

Figure 3. *A fetus at 10 weeks of development.*

When the organism is about nine weeks old, the embryo is called a **fetus**. At this stage, the fetus is about the size of a kidney bean and begins to take on the recognizable form of a human being as the "tail" begins to disappear.

From 9–12 weeks, the sex organs begin to differentiate. By the 12th week, the fetus has all its body parts including external genitalia. In the following weeks, the fetus will develop hair, nails, teeth and the excretory and digestive systems will continue to develop. At the end of the 12th week, the fetus is about 3 inches long and weighs about 28 grams.

At about 16 weeks, the fetus is approximately 4.5 inches long.

Fingers and toes are fully developed, and fingerprints are visible. During the 4-6th months, the eyes become more sensitive to light and hearing develops. The respiratory system continues to develop. Reflexes such as sucking, swallowing and hiccuping develop during the 5th month. Cycles of sleep and wakefulness are present at that time as well. Throughout the fetal stage, the brain continues to grow and develop, nearly doubling in size from weeks 16 to 28. The majority of the neurons in the brain have developed by 24 weeks although they are still rudimentary and the glial or nurse cells that support neurons continue to grow. At 24 weeks the fetus can feel pain (Royal College of Obstetricians and Gynecologists, 1997).

The first chance of survival outside the womb, known as the age of viability is reached at about 22 to 26 weeks (Moore & Persaud, 1998). By the time the fetus reaches the sixth month of development (24 weeks), it weighs up to 1.4 pounds. The hearing has developed, so the fetus can respond to sounds. The internal organs, such as the lungs, heart, stomach, and intestines, have formed enough that a fetus born prematurely at this point has a chance to survive outside of the mother's womb.

Between the 7th and 9th months, the fetus is primarily preparing for birth. It is exercising its muscles, its lungs begin to expand and contract. It is developing fat layers under the skin. The fetus gains about 5 pounds and 7 inches during this last trimester of pregnancy which includes a layer of fat gained during the 8th month. This layer of fat serves as insulation and helps the baby regulate body temperature after birth.

Around 36 weeks, the fetus is almost ready for birth. It weighs about 6 pounds and is about 18.5 inches long, and by week 37 all of the fetus's organ systems are developed enough that it could survive outside the mother's uterus without many of the risks associated with premature birth. The fetus continues to gain weight and grow in length until approximately 40 weeks. By then, the fetus has very little room to move around and birth becomes imminent.

Figure 4. *During the fetal stage, the baby's brain develops and the body adds size and weight until the fetus reaches full-term development.*

Watch It

Video 1. *Prenatal Development* explains many of the developmental milestones and changes that happen during each month of development for the embryo and fetus.

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Environmental Risks to Prenatal Development

Good prenatal care is essential. The developing child is most at risk for some of the most severe problems during the first three months of development. Unfortunately, this is a time at which most mothers are unaware that they are pregnant. It is estimated that 10% of all birth defects are caused by prenatal exposure or **teratogen**. Teratogens are factors that can contribute to birth defects which include some maternal diseases, drugs, alcohol, and stress. These exposures can also include environmental and occupational exposures. Today, we know many of the factors that can jeopardize the health of the developing child. Teratogen-caused birth defects are potentially preventable.

The study of factors that contribute to birth defects is called teratology. Teratogens are usually discovered after an increased prevalence of a particular birth defect. For example, in the early 1960s, a drug known as thalidomide was used to treat morning sickness. Exposure of the fetus during this early stage of development resulted in cases of phocomelia, a congenital malformation in which the hands and feet are attached to abbreviated arms and legs.

Teratogens

Alcohol

One of the most commonly used teratogens is alcohol. Because half of all pregnancies in the United States are unplanned, it is recommended that women of child-bearing age take great caution against drinking alcohol when not using birth control and when pregnant (Surgeon General's Advisory on Alcohol Use During Pregnancy, 2005). Alcohol consumption, particularly during the second month of prenatal development, but at any point during pregnancy, may lead to neurocognitive and behavioral difficulties that can last a lifetime.

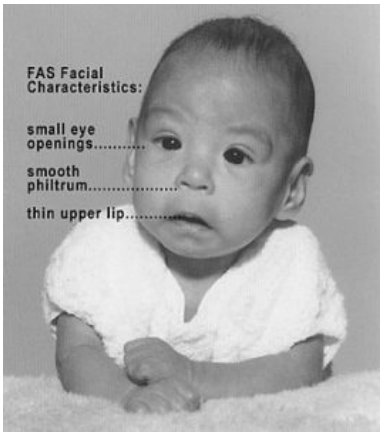

Figure 1. *Some distinguishing characteristics of fetal alcohol spectrum disorders include more narrow eye openings, A smooth philtrum, meaning a smooth area between the upper lip and the nose, and a thin upper lip.*

There is no acceptable safe limit for alcohol use during pregnancy, but binge drinking (5 or more drinks on a single occasion) or having 7 or more drinks during a single week places a child at particularly high risk. In extreme cases, alcohol consumption can lead to fetal death, but more frequently it can result in **fetal alcohol spectrum disorders (FASD)**. This terminology is now used when looking at the effects of exposure and replaces the term fetal alcohol syndrome. It is preferred because it recognizes that symptoms occur on a spectrum and that all individuals do not have the same characteristics. Children with FASD share certain physical features

such as flattened noses, small eye openings, small heads, intellectual developmental delays, and behavioral problems. Those with FASD are more at risk for lifelong problems such as criminal behavior, psychiatric problems, and unemployment (CDC, 2006).

The terms alcohol-related neurological disorder (ARND) and alcohol-related birth defects (ARBD) have replaced the term Fetal Alcohol Effects to refer to those with less extreme symptoms of FASD. ARBD includes kidney, bone, and heart problems.

watch it

Video 1. Medical experts debunk common myths about the safety of drinking alcohol during pregnancy in *The National Organization on Fetal Alcohol Syndrome* (NOFAS)*Several: Light Drinking.*

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=71#oembed-1

Tobacco

Smoking is also considered a teratogen because nicotine travels through the placenta to the fetus. When the mother smokes, the

developing baby experiences a reduction in blood oxygen levels. Tobacco use during pregnancy has been associated with low birth weight, placenta previa, birth defects, preterm delivery, fetal growth restriction, and sudden infant death syndrome. Smoking in the month before getting pregnant and throughout pregnancy increases the chances of these risks. Quitting smoking *before* getting pregnant is best. However, for women who are already pregnant, quitting as early as possible can still help protect against some health problems for the mother and baby.

Drugs

Prescription, over-the-counter, or recreational drugs can have serious teratogenic effects. In general, if medication is required, the lowest dose possible should be used. Combination drug therapies and first trimester exposures should be avoided. Almost three percent of pregnant women use illicit drugs such as marijuana, cocaine, Ecstasy and other amphetamines, and heroin. These drugs can cause low birth-weight, withdrawal symptoms, birth defects, or learning or behavioral problems. Babies born with a heroin addiction need heroin just like an adult addict. The child will need to be gradually weaned from the heroin under medical supervision; otherwise, the child could have seizures and die.

Environmental Chemicals

Environmental chemicals can include exposure to a wide array of agents including pollution, organic mercury compounds, herbicides, and industrial solvents. Some environmental pollutants of major concern include lead poisoning, which is connected with low birth weight and slowed neurological development. Children

who live in older housing in which lead-based paints have been used have been known to eat peeling paint chips thus being exposed to lead. The chemicals in certain herbicides are also potentially damaging. Radiation is another environmental hazard that a pregnant woman must be aware of. If a mother is exposed to radiation, particularly during the first three months of pregnancy, the child may suffer some congenital deformities. There is also an increased risk of miscarriage and stillbirth. Mercury leads to physical deformities and intellectual disabilities (Dietrich, 1999).

Sexually Transmitted Infections

Sexually transmitted infections (STIs) can complicate pregnancy and may have serious effects on both the mother and the developing baby. Most prenatal care today includes testing for STIs, and early detection is important. STIs, such as chlamydia, gonorrhea, syphilis, trichomoniasis, and bacterial vaginosis can all be treated and cured with antibiotics that are safe to take during pregnancy. STIs that are caused by viruses, like genital herpes, hepatitis B, or HIV cannot be cured. However, in some cases these infections can be treated with antiviral medications or other preventive measures can be taken to reduce the risk of passing the infection to the baby.

Maternal Diseases

Maternal illnesses increase the chance that a baby will be born with a birth defect or have a chronic health problem. Some of the diseases that are known to potentially have an adverse effect on the fetus include: diabetes, cytomegalovirus, toxoplasmosis, rubella, varicella, hypothyroidism, and Strep B. If the mother contracts Rubella during the first three months of pregnancy, damage can

occur in the eyes, ears, heart, or brain of the unborn child. On a positive note, Rubella has been nearly eliminated in the industrial world due to the vaccine created in 1969. Diagnosing these diseases early and receiving appropriate medical care can help improve the outcomes. Routine prenatal care now includes screening for gestational diabetes and Strep B.

Maternal Stress

Stress represents the effects of any factor able to threaten the homeostasis of an organism; these either real or perceived threats are referred to as the "stressors" and comprise a long list of potentially adverse factors, which can be emotional or physical. Because of a link in blood supply between a mother and fetus, it has been found that stress can leave lasting effects on a developing fetus, even before a child is born. The best-studied outcomes of fetal exposure to maternal prenatal stress are preterm birth and low birth weight. Maternal prenatal stress is also considered responsible for a variety of changes in the child's brain, and a risk factor for conditions such as behavioral problems, learning disorders, high levels of anxiety, attention deficit hyperactivity disorder, autism, and schizophrenia. Furthermore, maternal prenatal stress has been associated with a higher risk for a variety of immune and metabolic changes in the child such as asthma, allergic disorders, cardiovascular diseases, hypertension, hyperlipidemia, diabetes, and obesity.

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Factors influencing prenatal risks

There are several considerations in determining the type and amount of damage that might result from exposure to a particular teratogen (Berger, 2004). These include:

- **The timing of the exposure**: Structures in the body are vulnerable to the most severe damage when they are forming. If a substance is introduced during a particular structure's critical period (time of development), the damage to that structure may be greater. For example, the ears and arms reach their critical periods at about 6 weeks after conception. If a mother exposes the embryo to certain substances during this period, the arms and ears may be malformed.
- **The amount of exposure:** Some substances are not harmful unless the amounts reach a certain level. The critical level depends in part on the size and metabolism of the mother.
- **Genetics:** Genetic make-up also plays a role in the impact a particular teratogen might have on the child. This is suggested by fraternal twin studies who are exposed to the same prenatal environment, yet do not experience the same teratogenic effects. The genetic make-up of the mother can also have an effect; some mothers may be more resistant to teratogenic effects than others.
- **Being male or female:** Males are more likely to experience damage due to teratogens than are females. It is believed that the Y chromosome, which contains fewer genes than the X,

may have an impact.

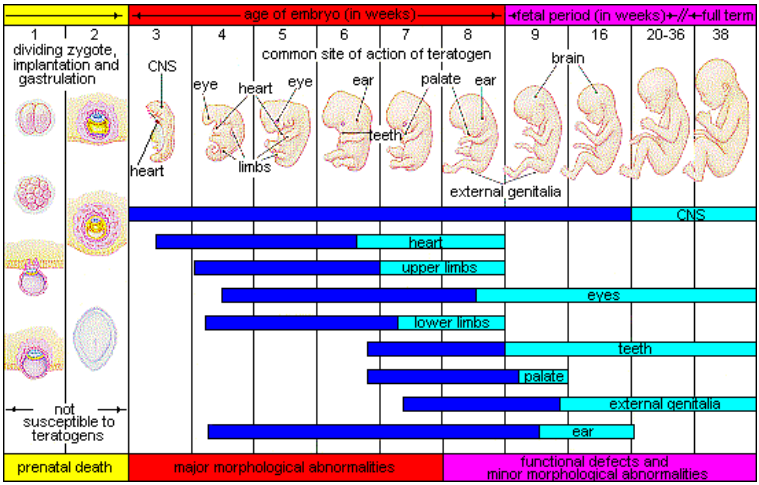

Figure 2. Critical Periods of Prenatal Development. *This image summarizes the three developmental periods in prenatal development. The blue images indicate where major development is happening and the aqua indicates where refinement is happening. As shown, the majority of organs are particularly susceptible during the embryonic period. The central nervous system still continues to develop in major ways through the fetal period as well.*

Complications of Pregnancy and Delivery

There are a number of common side effects of pregnancy. Not everyone experiences all of these nor do women experience them to the same degree. And although they are considered "minor" these problems are potentially very uncomfortable. These side effects include nausea (particularly during the first 3-4 months of pregnancy as a result of higher levels of estrogen in the system), heartburn, gas, hemorrhoids, backache, leg cramps,
insomnia, constipation,
shortness of breath or varicose veins (as a result of carrying a heavy load on the abdomen). What is the cure? Delivery!

Figure 1. *Pregnancy affects women in different ways; some notice few adverse side effects, while others feel high levels of discomfort, or develop more serious complications.*

Major Complications

The following are some serious complications of pregnancy that can pose health risks to mother and child and that often require special care.

- Gestational diabetes is when a woman without diabetes develops high blood sugar levels during pregnancy.
- Hyperemesis gravidarum is the presence of severe and persistent vomiting, causing dehydration and weight loss. It is more severe than the more common morning sickness.
- Preeclampsia is gestational hypertension. Severe preeclampsia involves blood pressure over 160/110 with additional signs. Eclampsia is a seizure in a pre-eclamptic patient.
- Deep vein thrombosis is the formation of a blood clot in a deep vein, most commonly in the legs.
- A pregnant woman is more susceptible to infections. This increased risk is caused by an increased immune tolerance in pregnancy to prevent an immune reaction against the fetus.
- Peripartum cardiomyopathy is a decrease in heart function which occurs in the last month of pregnancy, or up to six months post-pregnancy.

Maternal Mortality

Maternal mortality is unacceptably high. About 830 women die from pregnancy or childbirth-related complications around the world every day. It was estimated that in 2015, roughly 303,000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented. The high number of maternal deaths in some areas of the world reflects inequities in access to health services and highlights the gap between rich and poor. Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one-third occur in South Asia.

Almost all maternal deaths can be prevented, as evidenced by the huge disparities found between the richest and poorest countries.

The lifetime risk of maternal death in high-income countries is 1 in 3,300, compared to 1 in 41 in low-income.[1]

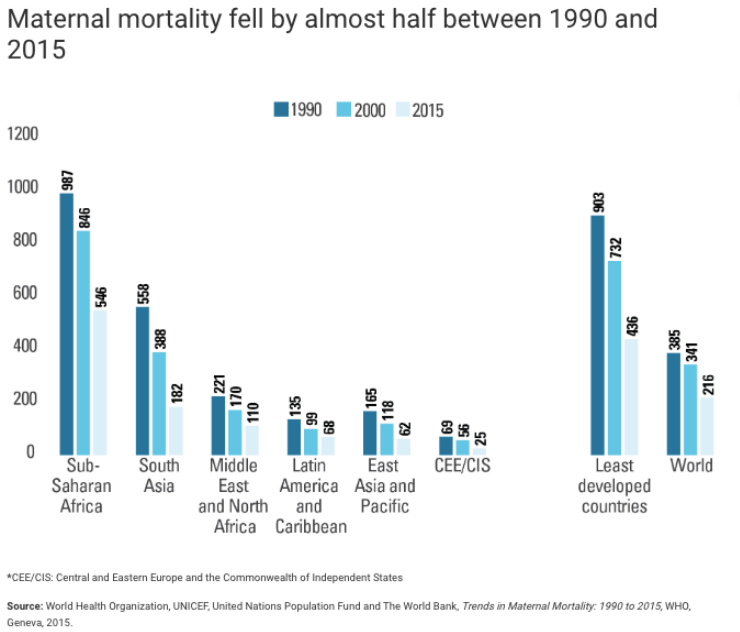

Figure 2. *This graph shows declining maternal mortality rates, as measured by the number of deaths per 100,000 live births. in 1990, 903 out of 100,000 live births resulted in death in the least developed countries, but that number has improved to 436 out of 100,000 births in 2015. Globally, there were 216 deaths for every 100,000 live births in 2015. Source: UNICEF, https://data.unicef.org/topic/maternal-health/maternal-mortality/.*

Even though maternal mortality in the United States is relatively rare today because of advances in medical care, it is still an issue that needs to be addressed. The number of reported pregnancy-

1. Maternal mortality (February 2018). World Health Organization. Retrieved from https://www.who.int/news-room/fact-sheets/detail/maternal-mortality

related deaths in the United States steadily increased from 7.2 deaths per 100,000 live births in 1987 to 18.0 deaths per 100,000 live births in 2014. The Centers for Disease Control and Prevention define a **pregnancy-related death** as the death of a woman while pregnant or within 1 year of the end of a pregnancy–regardless of the outcome, duration, or site of the pregnancy–from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. The reasons for the overall increase in pregnancy-related mortality are unclear. What do you think are some reasons for this surprising increase in the United States? What can be done to change this statistic?

Watch It: Maternal Mortality in the United States

Video 1. In the United States, black women are disproportionately more likely to die from complications related to pregnancy or childbirth than any other race; they are three or four times more likely than white women to die due to pregnancy-related death and are more likely to receive worse maternal care.[2] Black women from higher income groups and with advanced education levels also have heightened risks—even tennis superstar Serena Williams had near-deadly complications during the birth of

2. Black Women's Maternal Health: A Multifaceted Approach to Addressing Persistent and Dire Health Disparities (April 2018). National Partnership for Women and Families. Retrieved from http://www.nationalpartnership.org/our-work/health/reports/black-womens-maternal-health.html.

her daughter, Olympia. Why is this the case in our modern world? Watch this video to learn more:

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The data below shows percentages of the causes of pregnancy-related deaths in the United States during 2011–2014:

- Cardiovascular diseases, 15.2%.
- Non-cardiovascular diseases, 14.7%.
- Infection or sepsis, 12.8%.
- Hemorrhage, 11.5%.
- Cardiomyopathy, 10.3%.
- Thrombotic pulmonary embolism, 9.1%.
- Cerebrovascular accidents, 7.4%.
- Hypertensive disorders of pregnancy, 6.8%.
- Amniotic fluid embolism, 5.5%.
- Anesthesia complications, 0.3%.

The cause of death is unknown for 6.5% of all 2011–2014 pregnancy-related deaths.

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Miscarriage

Spontaneous abortion is experienced in an estimated 20-40 percent of undiagnosed pregnancies and in another 10 percent of diagnosed pregnancies. Usually, the body aborts due to chromosomal abnormalities and this typically happens before the 12th week of pregnancy. Cramping and bleeding result and normal periods return after several months. Some women are more likely to have repeated miscarriages due to chromosomal, amniotic, or hormonal problems; but miscarriage can also be a result of defective sperm (Carroll et al., 2003).

The Process of Delivery

Vaginal Delivery

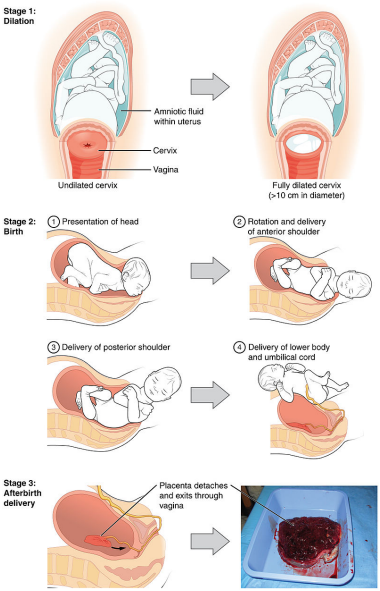

Figure 1. *The stages of childbirth.*

The first stage of labor is typically the longest. The First Stage of labor begins with uterine contractions that may initially last about 30 seconds and be spaced 15 to 20 minutes apart. These increase in duration and frequency to more than a minute in length and about 3 to 4 minutes apart. Typically, doctors advise that they should be called when contractions are coming about every 5 minutes. Some women experience false labor or Braxton-Hicks contractions, especially with the first child. These may come and go. They tend to diminish when the mother begins walking around. Real labor pains tend to increase with walking.

During this stage, the cervix or opening to the uterus dilates to 10 centimeters or just under 4 inches. This may take around 12-16 hours for first children or about 6-9 hours for women who have previously given birth. It takes one woman in 9 over 24 hours to dilate completely. Labor may also begin with a discharge of blood or amniotic fluid. If the amniotic sack breaks, which happens for one out of eight pregnancies, labor will be induced if necessary to reduce the risk of infection.

The second stage involves the passage of the baby through the birth canal. This stage takes about 10-40 minutes. Contractions usually come about every 2-3 minutes. The mother pushes and relaxes as directed by the medical staff. Normally the head is delivered first. The baby is then rotated so that one shoulder can come through and then the other shoulder. The rest of the baby quickly passes through. The baby's mouth and nose are suctioned out. The umbilical cord is clamped and cut.

The third stage is relatively painless in comparison to the other stages. During this stage, the placenta or afterbirth is delivered. This typically occurs within 20 minutes after the delivery of the baby. If tearing of the vagina occurred during birth, the tear may be stitched at this time.

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Video 1. *Norma Labour & Vavinal Birth* animates the process of vaginal delivery.

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Cesarean Delivery

Cesarean section, also known as **C-section**, or **cesarean delivery**, is the use of surgery to deliver babies. A cesarean section is often necessary when a vaginal delivery would put the baby or mother at risk. This may include obstructed labor, twin pregnancy, high blood pressure in the mother, breech birth, or problems with the placenta or umbilical cord. Cesarean delivery may be performed based upon the shape of the mother's pelvis or history of a previous C-section. A trial of vaginal birth after C-section may be possible. The World Health Organization recommends that cesarean section be performed only when medically necessary. Some C-sections are performed without a medical reason, upon request by someone, usually the mother.

Watch it

Video 2. *C-section* animates the process of Cesarean delivery.

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Video 3. C-Section with the Mobius® Elastic Retractor is

a medical demonstration depicting a real Cesarean delivery (graphic content).

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Approaches to Childbirth

What comes to your mind when you think about a woman giving birth? Some may describe it as beautiful, a miracle, and a rite of passage. Others may think of pain, fear, and discomfort. Labor and delivery is not an easy feat. It is called *labor* after all because it is a lot of work! In this section, you'll learn more about the various approaches to childbirth as well as the actual process.

Approaches to Childbirth

Figure 1. *This couple prepares for their baby by attending a class where they learn useful skills related to childbirth and infant care, including swaddling.*

Prepared childbirth refers to being not only physically in good condition to help provide a healthy environment for the baby to develop, but also helping a couple to prepare to accept their new roles as parents and to get information and training that will assist them for delivery and life with the baby as much as possible. The more a couple can learn about childbirth and the newborn, the better prepared they will be for the adjustment they must make to a new life. Nothing can prepare a couple for this completely. Once a couple finds that they are to have a child, they begin to conjure up images of what they think the experience will involve. Once the child is born, they must

reconcile those images with reality (Galinsky, 1987). Knowing more of what to expect does help them in forming more realistic images thus making the adjustment easier. Let's explore some of the methods of prepared childbirth.

HypnoBirthing

Grantley Dick-Read was an English obstetrician and pioneer of prepared childbirth in the 1930s. In his book *Childbirth Without Fear*, he suggests that the fear of childbirth increases tension and makes the process of childbearing more painful. He believed that if mothers were educated, the fear and tension would be reduced and the need for medication could frequently be eliminated. The Dick-Read method emphasized the use of relaxation and proper breathing with contractions as well as family support and education. Today this method is known as the Mongan Method or HypnoBirthing. Women using this method report feeling like they are lost in a daydream, but focused and in control.

The Lamaze Method

This method originated in Russia and was brought to the United States in the 1950s by Fernand Lamaze. The emphasis of this method is on teaching the woman to be in control in the process of delivery. It includes learning muscle relaxation, breathing through contractions, having a focal point (usually a picture to look at) during contractions, and having a support person who goes through the training process with the mother and serves as a coach during delivery. The Lamaze Method is still the most commonly taught method in the U.S. today.

The Bradley Method

This method originated in the late 1940s and helps women deliver naturally, with few or no drugs. There are a series of courses that emphasize excellent nutrition and exercise, relaxation techniques to manage pain, and the involvement of the partner as a coach. Parents-to-be are taught to be knowledgeable consumers of birth services and to take responsibility in making informed decisions regarding procedures, attendants and the birthplace. In turn, this will lead to keeping mothers healthy and low-risk in order to avoid complications that may lead to medical intervention.

Nurse-Midwives

Historically in the United States, most babies were born under the care of lay midwives. In the 1920s, middle-class women were increasingly using doctors to assist with childbirth but rural women were still being assisted by lay midwives. The nursing profession began educating nurse-midwives to assist these women. Nurse-midwives continued to assist most rural women with delivery until the 1970s and 1980s when their growth is thought to have posed a threat to the medical profession (Weitz, 2007). Women who are at low risk for birth complications can successfully deliver under the care of nurse-midwives. Some hospitals give privileges to nurse-midwives to deliver there. They may also deliver babies at home or in birthing centers.

Home Birth

Because one out of every 20 births involves a complication, most medical professionals recommend that delivery take place in a

hospital. However, some couples choose to have their baby at home. About 1 percent of births occur outside of a hospital in the United States. Two-thirds of these are home births and more than half of these are assisted by midwives. In the United States, women who have had previous children, who are over 25, and who are white are most likely to not give birth in a hospital (MacDorman et al., 2010).

Birthing Centers

A birthing center presents a more home-like environment than a hospital labor ward, typically with more options during labor: food/drink, music, and the attendance of family and friends if desired. Other characteristics can also include non-institutional furniture such as queen-sized beds, large enough for both mother and father, and perhaps birthing tubs or showers for water births. The decor is meant to emphasize the normality of birth. In a birth center, women are free to act more spontaneously during their birth, such as squatting, walking or performing other postures that assist in labor. Active birth is encouraged. The length of stay after birth is shorter at a birth center; sometimes just 6 hours after birth the mother and infant can go home. One-third of out-of-hospital births occur in freestanding clinics, birthing centers, or in physicians' offices or other locations.

Water Birth

Laboring and/or giving birth in a warm tub of water can help a woman relax. The buoyancy of the water can help alleviate discomfort and pressure for the mother. Many hospitals have birthing tubs that allow women to labor in them. However, only

some hospitals allow for birth to take place in the water. Some believe that water birth gives a more calm and tranquil transition for the baby from the womb. Water births are more common to occur at home or in birthing centers.

watch it

Video 1. *Waterbirth* depicts the real birth of twins underwater. (graphic content)

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Hospital Birth

Most births in the U.S. occur in hospitals. Mothers have the choice to have a medicated or unmedicated delivery. Some women do fine with "natural methods" of pain relief alone. Many women blend "natural methods" with medications and medical interventions that relieve pain. Building a positive outlook on childbirth and managing fear may also help some women cope with the pain. Labor pain is not like pain due to illness or injury. Instead, it is caused by

contractions of the uterus that are pushing the baby down and out of the birth canal. In other words, labor pain has a purpose.

The most common pain relief method used during labor and delivery is an epidural. An epidural is a procedure that involves placing a tube into the lower back, into a small space outside the spinal cord. Small doses of medicine can be given through the tube as needed throughout labor. With an epidural, pain relief starts 10 to 20 minutes after the medicine has been given. The degree of numbness felt can be adjusted. An epidural can prolong the first and second stages of labor. If given late in labor or if too much medicine is used, it might be hard to push when the time comes.

watch it

Video 2. *Epidural Anaesthesia* demonstrates this procedure.

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Another form of pharmacologic pain relief available for laboring mothers is inhaled nitrous oxide. This is typically a 50/50 mixture of nitrous oxide with air that is an inhaled analgesic and anesthetic. Nitrous oxide has been used for pain management in childbirth since the late 1800s. The use of inhaled analgesia is commonly used

in the UK, Finland, Australia, Singapore, and New Zealand, and is gaining in popularity in the United States.[1]

Making A Birth Plan

As you can see, women have many choices when it comes to the approach they want to take in preparing for childbirth. What decisions would you make? Learn how to create a birth plan.

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Newborn Assessment and Risk

Assessing the Neonate

There are several ways to assess the condition of the newborn. The most widely used tool is the Neonatal Behavioral Assessment Scale (NBAS) developed by T. Berry Brazelton. This tool has been used around the world to help parents get to know their infants and to make comparisons of infants in different cultures (Brazelton & Nugent, 1995). The baby's motor development, muscle tone, and stress response are assessed.

The APGAR is conducted one minute and five minutes after birth. This is a very quick way to assess the newborn's overall condition. Five measures are assessed: the heart rate, respiration, muscle tone (quickly assessed by a skilled nurse when the baby is handed to them or by touching the baby's palm), reflex response (the Babinski reflex is tested), and color. A score of 0 to 2 is given on each feature examined. An APGAR of 5 or less is cause for concern. The second APGAR should indicate improvement with a higher score.

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Video 1. *APGAR Score* explains how to calculate the APGAR score for a newborn.

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> *https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=75#oembed-2*

Complications of the Newborn

Low Birth Weight

We have been discussing a number of teratogens associated with a low birth weight such as cocaine, tobacco, etc. A child is considered to have a low birth weight if they weigh less than 5.8 pounds (2500 grams). About 8.17 percent of babies born in the United States are of low birth weight and 1.4 percent are born very low birth weight. A low birth weight baby has difficulty maintaining adequate body temperature because it lacks the fat that would otherwise provide insulation. Such a baby is also at more risk of infection. And 67 percent of these babies are also preterm which can make them more at risk for a respiratory infection. Very low birth weight babies (2 pounds or less) have an increased risk of developing cerebral palsy. Many causes of low birth weight are preventable with proper prenatal care.

Premature Birth

A child might also have a low birth weight if it is born at less than 37 weeks gestation (which qualifies it as a preterm baby). In 2016, 9.85 percent of babies born in the U.S. were preterm.[1] Early birth can be triggered by anything that disrupts the mother's system. For instance, vaginal infections or gum disease can actually lead to premature birth because such infection causes the mother to release anti-inflammatory chemicals which, in turn, can trigger contractions. Smoking and the use of other teratogens can also lead to preterm birth.

Anoxia and Hypoxia

One of the leading causes of infant brain damage is lack of oxygen shortly after birth. Hypoxia occurs when the infant is deprived of an adequate amount of oxygen, leading to mild to moderate brain damage. Apoxia occurs when the infant undergoes a total lack of oxygen, which can lead to severe brain damage. This lack of oxygen is typically caused by umbilical cord problems, birth canal problems, blocked airways, and placenta abruption. Both hypoxia and anoxia can lead to cerebral palsy and a host of other medical disorders.

1. Birthweight and Gestation. Centers for Disease Control and Prevention (2016). Retrieved from https://www.cdc.gov/nchs/fastats/birthweight.htm

Glossary

adoption study: a behavior genetic research method that involves the comparison of adopted children to their adoptive and biological parents

allele: a specific version of a gene

amniotic sac: a fluid-filled sac that protects and contains the fetus in the uterus

behavioral genetics: the empirical science of how genes and environments combine to generate behavior

cesarean section: is the use of surgery to deliver babies through the mother's abdomen and uterus

chromosome: a DNA molecule with part or all of the genetic material of an organism

deoxyribonucleic acid (DNA): a helix-shaped molecule made up of nucleotide base pairs

dizygotic: derived from two separate ova

embryo: a multi-celled organism between two and eight weeks after fertilization

epigenetics: the study of heritable phenotype changes that do not involve alterations in the DNA sequence; the prefix epi- means above

evolutionary psychology: a field of psychology that focuses on how universal patterns of behavior and cognitive processes have evolved over time

fetal alcohol spectrum disorders: a group of abnormalities in babies born to mothers who consume alcohol during pregnancy

fetus: an unborn human baby from nine weeks after conception until birth

gamete: a male or female reproductive cell

genes: sequences of DNA that control or partially control a number of characteristics

genotype: the genetic makeup of an individual

heterozygous: a combination of alleles for a given gene

homozygous: having two copies of the same allele for a given gene

mitosis: the process of cell division

monozygotic: derived from a single ovum

mutation: a sudden permanent change in a gene

phenotype: the individual's inherited physical characteristics

placenta: an organ that develops in the uterus during pregnancy to provide oxygen and nutrients to the prenate via the umbilical cord

pregnancy-related death: the death of a woman while pregnant or within 1 year of the end of a pregnancy from any cause related to or aggravated by the pregnancy

prenatal diagnosis: an aspect of prenatal care focused on pursuing additional detailed information once a particular problem has been found

prenatal screening: an aspect of prenatal care focused on finding problems among a large population with affordable and noninvasive methods

quantitative genetics: scientific and mathematical methods for inferring genetic and environmental processes based on the degree of genetic and environmental similarity among organisms

teratogen: any agent which can cause a birth defect

theory of evolution by natural selection: the process by which organisms change over time so that those with genes and behaviors better suited for their environment will survive and reproduce, while those that are poorly suited for their environment will die off

twin studies: a behavior genetic research method that involves a comparison of the similarity of identical (monozygotic; MZ) and fraternal (dizygotic; DZ) twins

zygote: a one-cell structure that is created when a sperm and egg merge

PHYSICAL DEVELOPMENT IN INFANCY THROUGH ADOLESCENCE

Learning Objectives

- Summarize overall physical growth patterns during infancy, early childhood, middle childhood, and adolescence
- Describe pubertal changes in body size, proportions, and sexual maturity
- Explain social and emotional attitudes and reactions toward puberty, including sex differences
- Describe sexual development from infancy through adolescence
- Describe the growth and changes in the brain from infancy through adolescence
- Explain gross and fine motor skills in infants and early childhood
- Explain newborn perceptual abilities
- Identify the nutritional concerns of infants, children, and adolescents
- Summarize concerns associated with eating disorders
- Describe sleep concerns from infancy to adolescence
- Explain the vaccination debate and its

consequences

Welcome to the story of development from infancy through adolescence. Did you ever wonder how babies grow from tiny, helpless infants into well-developed and independent adults? It doesn't happen overnight, but the process begins right from day one. We'll begin this module by reviewing the rapid physical development that occurs during infancy and early childhood, the changes of middle childhood, and finally, the maturation during adolescence. In some ways, the changes in adolescence are more dramatic than those that occur in infancy—unlike infants, adolescents are aware of the changes that are taking place and of what the changes mean. In this section, we will learn about the pubertal changes in body size, proportions, and sexual maturity, as well as the social and emotional attitudes and reactions toward puberty. Since nutrition and health are so important throughout childhood and adolescence for lifetime development, and the consequence of neglect can be severe, we will consider some of the influences on early physical growth, particularly the importance of nutrition and some of the health concerns during adolescence, including eating disorders.

The obvious physical changes are accompanied by changes in the brain. While we may not observe the actual brain changing, we can see the effects of the brain changes in the way that children sense, move, sleep, play, and learn. We will explore how infants' senses develop and how sensory systems like hearing and vision operate, and how infants take in information through their senses and transform it into meaningful information. Infants are also born with motor abilities. At birth, infants are equipped with a number of reflexes, which are involuntary movements in response to stimulation. We will explore how these innate reflexes are eventually modified through experiences to become voluntary

movements and the basis for motor development as skills emerge throughout childhood.

Physical Growth

Physical Growth in Infancy

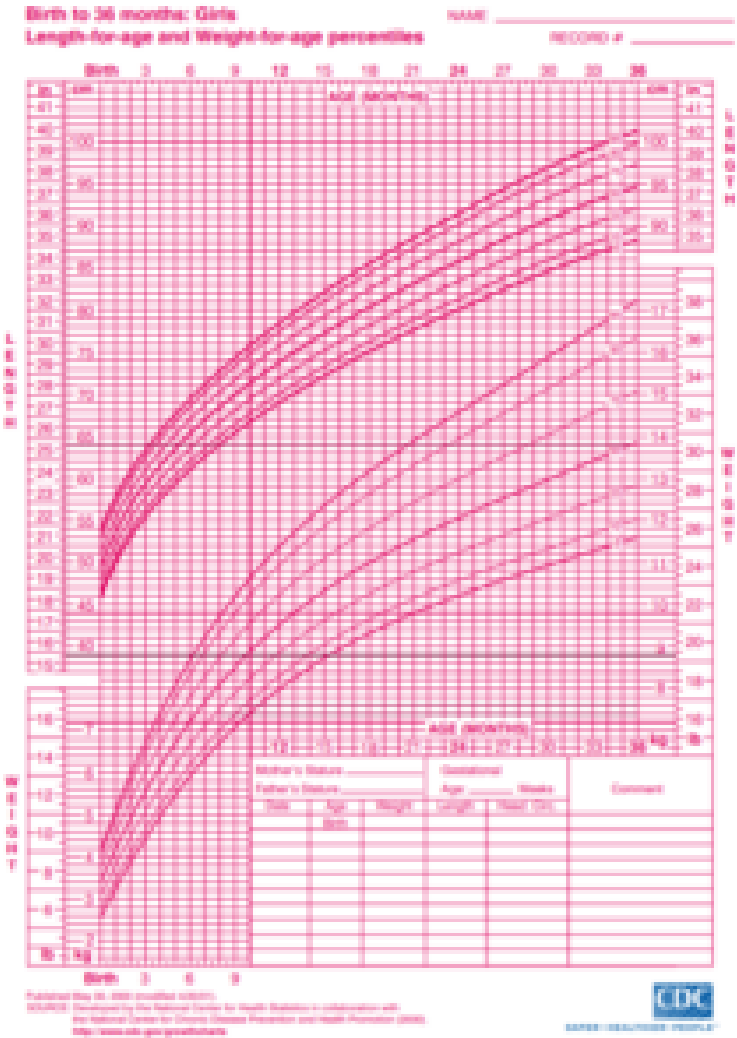
The average newborn weighs approximately 7.5 pounds, although a healthy birth weight for a full-term baby is considered to be between 5 pounds, 8 ounces (2,500 grams), and 8 pounds, 13 ounces (4,000 grams). The average length of a newborn is 19.5 inches, increasing to 29.5 inches by 12 months and 34.4 inches by 2 years old (WHO Multicentre Growth Reference Study Group, 2006).

For the first few days of life, infants typically lose about 5 percent of their body weight as they eliminate waste and get used to feeding. This often goes unnoticed by most parents but can be cause for concern for those who have a smaller infant. This weight loss is temporary, however, and is followed by a rapid period of growth. By the time an infant is 4 months old, it usually doubles in weight, and by one year has tripled its birth weight. By age 2, the weight has quadrupled. The average length at 12 months (one-year-old) typically ranges from 28.5-30.5 inches. The average length at 24 months (two years old) is around 33.2-35.4 inches (CDC, 2010).

Figure 1. *Children experience rapid physical changes through infancy and early childhood. (credit "left": modification of work by Kerry Ceszyk; credit "middle-left": modification of work by Kristi Fausel; credit "middle-right": modification of work by "devinf"/Flickr; credit "right": modification of work by Rose Spielman)*

Monitoring Physical Growth

As mentioned earlier, growth is so rapid in infancy that the consequences of neglect can be severe. For this reason, gains are closely monitored. At each well-baby check-up, a baby's growth is compared to that baby's previous numbers. Often, measurements are expressed as a **percentile** from 0 to 100, which compares each baby to other babies of the same age. For example, weight at the 40th percentile means that 40 percent of all babies weigh less, and 60 percent weigh more. For any baby, pediatricians and parents can be alerted early just by watching percentile changes. If an average baby moves from the 50th percentile to the 20th, this could be a sign of **failure to thrive,** which could be caused by various medical conditions or factors in the child's environment. The earlier the concern is detected, the earlier intervention and support can be provided for the infant and caregiver.


Birth to 36 months: Girls
Length-for-age and Weight-for-age percentiles
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AGE (MONTHS)
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Father's Stature
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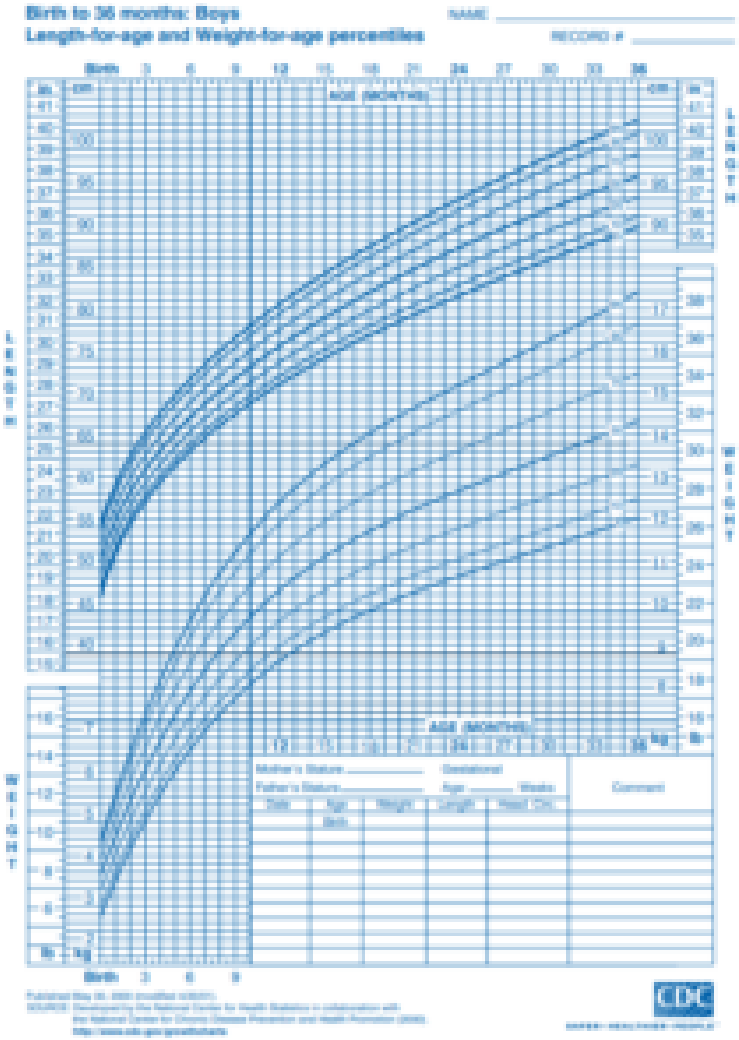

Figure 2. Growth charts display a normal growth curve for boys and girls from birth to 3 years old.

Body Proportions

Another dramatic physical change that takes place in the first several years of life is a change in body proportions. The head initially makes up about 50 percent of a person's entire length when developing in the womb. At birth, the head makes up about 25 percent of a person's length (just imagine how big your head would be if the proportions remained the same throughout your life!). In adulthood, the head comprises about 15 percent of a person's length. Imagine how difficult it must be to raise one's head during the first year of life! And indeed, if you have ever seen a 2- to 4-month-old infant lying on their stomach trying to raise the head, you know how much of a challenge this is.

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Physical Growth in Early Childhood

Children between the ages of 2 and 6 years tend to grow about 3 inches in height each year and gain about 4 to 5 pounds in weight each year. The average 6-year-old weighs about 46 pounds and is about 46 inches in height. The 3-year-old is very similar to a toddler with a large head, large stomach, short arms, and short legs. During early childhood, children start to lose some of their baby fat, making them less like a baby, and more like a child as they progress through this stage. By around age 3, children will have all 20 of their primary

teeth, and by around age 4, may have 20/20 vision. Many children take a daytime nap until around age 4 or 5, then sleep between 11 and 13 hours at night.

By the time the child reaches age 6, the torso has lengthened and body proportions have become more like those of adults. It should be noted that these growth patterns are seen where children receive adequate nutrition. Studies from many countries support the assertion that children tend to grow more slowly in low SES areas, and thus they are smaller.

This growth rate is slower than that of infancy and is accompanied by a reduced appetite between the ages of 2 and 6. This change can sometimes be surprising to parents and lead to the development of poor eating habits.

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Physical Growth in Middle Childhood

Rates of growth generally slow during middle childhood. Typically, a child will gain about 5-7 pounds a year and grow about 2 inches per year. Many girls and boys experience a prepubescent growth spurt, but this growth spurt tends to happen earlier in girls (around age 9-10) than it does in boys (around age 11-12). Because of this, girls are often taller than boys at the end of middle childhood. Children in middle childhood tend to slim down and gain muscle strength

and lung capacity making it possible to engage in strenuous physical activity for long periods of time.

The brain reaches its adult size at about age 7. That is not to say, however, that the brain is fully developed by age 7. The brain continues to develop for many years after it has attained its adult size. The school-aged child is better able to plan, coordinate activity using both left and right hemispheres of the brain, and to control emotional outbursts. Paying attention is also improved as the prefrontal cortex matures. As the myelin continues to develop throughout middle childhood, the child's reaction time improves as well.

During middle childhood, physical growth slows down. One result of the slower rate of growth is an improvement in motor skills. Children of this age tend to sharpen their abilities to perform both gross motor skills such as riding a bike and fine motor skills such as cutting their fingernails.

Losing Primary Teeth

Deciduous teeth, commonly known as milk teeth, baby teeth, primary teeth, and temporary teeth, are the first set of teeth in the growth development of humans. The primary teeth are important for the development of the mouth, development of the child's speech, for the child's smile, and play a role in chewing food, Most children lose their first tooth around age 6, then continue to lose teeth for the next 6 years. In general, children lose the teeth in the

middle of the mouth first and then lose the teeth next to those in sequence over the 6-year span. By age 12, generally, all of the teeth are permanent teeth, however, it is not extremely rare for one or more primary teeth to be retained beyond this age, sometimes well into adulthood, often because the secondary tooth fails to develop.

Physical Growth in Adolescence

Puberty is the period of rapid growth and sexual development that begins in adolescence and starts at some point between ages 8 and 14. While the sequence of physical changes in puberty is predictable, the onset and pace of puberty vary widely. Every person's individual timetable for puberty is different and is primarily influenced by heredity; however environmental factors—such as diet and exercise—also exert some influence.

Adolescence has evolved historically, with evidence indicating that this stage is lengthening as individuals start puberty earlier and transition to adulthood later than in the past. Puberty today begins, on average, at age 10–11 years for girls and 11–12 years for boys. This average age of onset has decreased gradually over time since the 19th century by 3–4 months per decade, which has been attributed to a range of factors including better nutrition, obesity, increased father absence, and other environmental factors (Steinberg, 2013). Completion of formal education, financial independence from parents, marriage, and parenthood have all been markers of the end of adolescence and beginning of adulthood, and all of these transitions happen, on average, later now than in the past. In fact, the prolonging of adolescence has prompted the introduction of a new developmental period called emerging adulthood that captures these developmental changes out of adolescence and into adulthood, approximately occurring from ages 18 to 29 (Arnett,

2000). We'll learn more about this phase in the next module on early adulthood.

Hormonal Changes

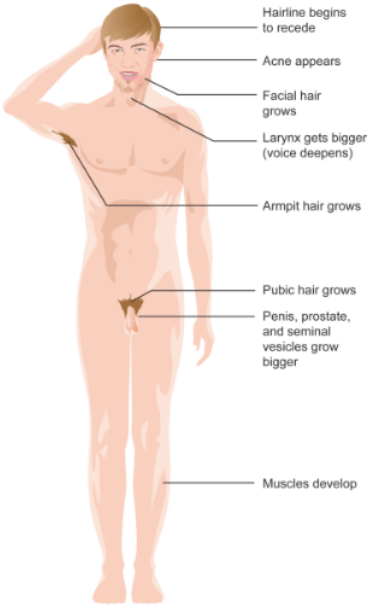

Figure 3. *Major physical changes in males during puberty.*

Puberty involves distinctive physiological changes in an individual's height, weight, body composition, and circulatory and respiratory systems, and during this time, both the adrenal glands and sex glands mature. These changes are largely influenced by hormonal activity. Many hormones contribute to the beginning of puberty, but most notably a major rush of **estrogen** for girls and **testosterone** for boys. Hormones play an *organizational role* (priming the body to behave in a certain way once puberty begins) and an *activational role* (triggering certain behavioral and physical changes). During puberty, the adolescent's hormonal balance shifts strongly towards an adult state; the process is triggered by the pituitary gland, which secretes a surge of hormonal agents into the bloodstream and initiates a chain reaction.

Puberty occurs over two distinct phases, and the first phase, **adrenarche**, begins at 6 to 8 years of age and involves increased production of adrenal androgens that contribute to a number of pubertal changes—such as skeletal growth. The second phase of puberty, **gonadarche**, begins several years later and involves

increased production of hormones governing physical and sexual maturation.

Sexual Maturation

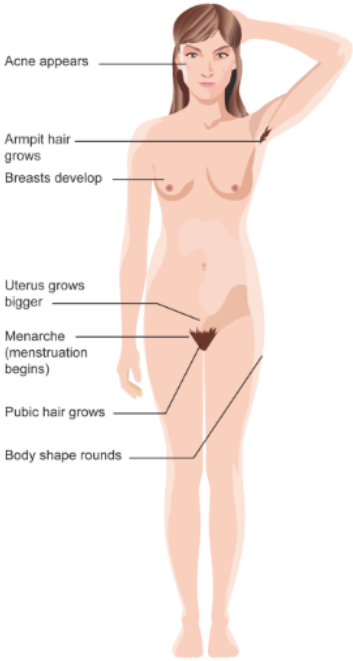

Figure 4. *Major physical changes in females during puberty.*

During puberty, primary and secondary sex characteristics develop and mature. **Primary sex characteristics** are organs specifically needed for reproduction—the uterus and ovaries in females and testes in males. **Secondary sex characteristics** are physical signs of sexual maturation that do not directly involve sex organs, such as the development of breasts and hips in girls, and the development of facial hair and a deepened voice in boys. Both sexes experience the development of pubic and underarm hair, as well as increased development of sweat glands.

The male and female **gonads** are activated by the surge of the hormones discussed earlier, which puts them into a state of rapid growth and development. The testes primarily release testosterone and the ovaries release estrogen; the production of these hormones increases gradually until sexual maturation is met.

For girls, observable changes begin with nipple growth and pubic hair. Then the body increases in height while fat forms particularly

on the breasts and hips. The first menstrual period (**menarche**) is followed by more growth, which is usually completed by four years after the first menstrual period began. Girls experience menarche usually around 12–13 years old. For boys, the usual sequence is the growth of the testes, initial pubic-hair growth, growth of the penis, first ejaculation of seminal fluid (**spermarche**), appearance of facial hair, a peak growth spurt, deepening of the voice, and final pubic-hair growth. (Herman-Giddens et al, 2012). Boys experience spermarche, the first ejaculation, around 13–14 years old.

Physical Growth: The Growth Spurt

During puberty, both sexes experience a rapid increase in height and weight (referred to as a **growth spurt**) over about 2-3 years resulting from the simultaneous release of growth hormones, thyroid hormones, and androgens. Males experience their growth spurt about two years later than females. For girls, the growth spurt begins between 8 and 13 years old (average 10-11), with adult height reached between 10 and 16 years old. Boys begin their growth spurt slightly later, usually between 10 and 16 years old (average 12-13), and reach their adult height between 13 and 17 years old. Both nature (i.e., genes) and nurture (e.g., nutrition, medications, and medical conditions) can influence both height and weight.

Before puberty, there are nearly no differences between males and females in the distribution of fat and muscle. During puberty, males grow muscle much faster than females, and females experience a higher increase in body fat and bones become harder and more brittle. An adolescent's heart and lungs increase in both size and capacity during puberty; these changes contribute to increased strength and tolerance for exercise.

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Reactions Toward Puberty and Physical Development

The accelerated growth in different body parts happens at different times, but for all adolescents, it has a fairly regular sequence. The first places to grow are the extremities (head, hands, and feet), followed by the arms and legs, and later the torso and shoulders. This non-uniform growth is one reason why an adolescent body may seem out of proportion. Additionally, because rates of physical development vary widely among teenagers, puberty can be a source of pride or embarrassment.

Most adolescents want nothing more than to fit in and not be distinguished from their peers in any way, shape, or form (Mendle, 2015). So when a child develops earlier or later than his or her

peers, there can be long-lasting effects on mental health. Simply put, beginning puberty earlier than peers presents great challenges, particularly for girls. The picture for early-developing boys isn't as clear, but evidence suggests that they, too, eventually might suffer ill effects from maturing ahead of their peers. The biggest challenges for boys, however, seem to be more related to late development.

As mentioned in the Khan Academy video about physical development, early maturing boys tend to be stronger, taller, and more athletic than their later maturing peers. They are usually more popular, confident, and independent, but they are also at a greater risk for substance abuse and early sexual activity (Flannery, Rowe, & Gulley, 1993; Kaltiala-Heino, Rimpela, Rissanen, & Rantanen, 2001). Additionally, more recent research found that while early-maturing boys initially had lower levels of depression than later-maturing boys, over time they showed signs of increased anxiety, negative self-image, and interpersonal stress. (Rudolph, Troop-Gordon, Lambert, & Natsuaki, 2014).

Early maturing girls may be teased or overtly admired, which can cause them to feel self-conscious about their developing bodies. These girls are at increased risk of a range of psychosocial problems including depression, substance use and early sexual behavior (Graber, 2013). These girls are also at a higher risk for eating disorders, which we will discuss in more detail later in this module (Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Striegel-Moore & Cachelin, 1999).

Late-blooming boys and girls (i.e., they develop more slowly than their peers) may feel self-conscious about their lack of physical development. Negative feelings are particularly a problem for late maturing boys, who are at a higher risk for depression and conflict with parents (Graber et al., 1997) and more likely to be bullied (Pollack & Shuster, 2000).

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Video 1. *Development in Adolescence* provides an overview of physical changes during adolescence and psychosocial impacts.

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Sexual Development

Historically, children have been thought of as innocent or incapable of sexual arousal (Aries, 1962). A more modern approach to sexuality suggests that the physical dimension of sexual arousal is present from birth. That said, it seems to be the case that the elements of seduction, power, love, or lust that are part of the adult meanings of sexuality are not present in sexual arousal at this stage. In contrast, sexuality begins in childhood as a response to physical states and sensation and cannot be interpreted as similar to that of adults in any way (Carroll, 2007).

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Video 4.3.1. "*What Happens When?*" *Child and Adolescent Sexual Development* explains major milestones in sexual development throughout childhood and adolescence, as well as how to support kids during these stages.

Infancy

Boys and girls are capable of erections and vaginal lubrication even before birth (Martinson, 1981). Arousal can signal overall physical contentment and stimulation that accompanies feeding or warmth. Infants begin to explore their bodies and touch their genitals as

soon as they have sufficient motor skills. This stimulation is for comfort or to relieve tension rather than to reach orgasm (Carroll, 2007).

Early Childhood

Self-stimulation is common in early childhood for both boys and girls. Curiosity about the body and about others' bodies is a natural part of early childhood as well. Consider this example. A mother is asked by her young daughter: "So it's okay to see a boy's privates as long as it's the boy's mother or a doctor?" The mother hesitates a bit and then responds, "Yes. I think that's alright." "Hmmm," the girl begins, "When I grow up, I want to be a doctor!" Hopefully, this subject is approached in a way that teaches children to be safe and know what is appropriate without frightening them or causing shame.

As children grow, they are more likely to show their genitals to siblings or peers, and to take off their clothes and touch each other (Okami et al., 1997). Masturbation is common for both boys and girls. Boys are often shown by other boys how to masturbate, but girls tend to find out accidentally. Boys masturbate more often and touch themselves more openly than do girls (Schwartz, 1999).

Hopefully, parents respond to this without undue alarm and without making the children feel guilty about their bodies. Instead, messages about what is going on and the appropriate time and place for such activities help the child learn what is appropriate.

Parents should take the time to speak with their children about when it is appropriate for other people to see or touch them. Many experts suggest that this should occur as early as age 3, and of course the discussion should be appropriate for the child's age. One way to help a young child understand inappropriate touching is to discuss "bathing suit areas." Kids First, Inc. suggests discussing the following: "No one should touch you anywhere your bathing

suit covers. No one should ask you to touch them somewhere that their bathing suit covers. No one should show you a part of their or someone else's bodies that their bathing suit covers." Further, instead of talking about good or bad touching, talk about safe and unsafe touching. This way children will not feel guilty later on when that sort of touching is appropriate in a relationship.

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Adolescence

Developing sexually is an expected and natural part of growing into adulthood. Healthy sexual development involves more than sexual behavior. It is the combination of physical sexual maturation (puberty, age-appropriate sexual behaviors), the formation of a positive sexual identity, and a sense of sexual well-being (discussed more in-depth later in this module). During adolescence, teens strive to become comfortable with their changing bodies and to make healthy, safe decisions about which sexual activities, if any, they wish to engage in.

Earlier in the physical development section, we discussed **primary and secondary sex characteristics**. During puberty, every primary sex organ (the ovaries, uterus, penis, and testes) increases dramatically in size and matures in function. During puberty, reproduction becomes possible. Simultaneously, secondary sex characteristics develop. These characteristics are not required for

reproduction, but they do signify masculinity and femininity. At birth, boys and girls have similar body shapes, but during puberty, males widen at the shoulders and females widen at the hips and develop breasts (examples of secondary sex characteristics). Sexual development is impacted by a dynamic mixture of physical and cognitive change coupled with social expectations. With physical maturation, adolescents may become alternately fascinated with and chagrined by their changing bodies, and often compare themselves to the development they notice in their peers or see in the media. For example, many adolescent girls focus on their breast development, hoping their breasts will conform to an ideal body image.

As sex hormones cause biological changes, they also affect the brain and trigger sexual thoughts. Culture, however, shapes actual sexual behaviors. Emotions regarding sexual experience, like the rest of puberty, are strongly influenced by cultural norms regarding what is expected at what age, with peers being the most influential. Simply put, the most important influence on adolescents' sexual activity is not their bodies, but their close friends, who have more influence than do sex or ethnic group norms (van de Bongardt et al., 2015).

Sexual interest and interaction are a natural part of adolescence. Sexual fantasy and **masturbation** episodes increase between the ages of 10 and 13. Masturbation is very ordinary—even young children have been known to engage in this behavior. As the bodies of children mature, powerful sexual feelings begin to develop, and masturbation helps release sexual tension. For adolescents, masturbation is a common way to explore their erotic potential, and this behavior can continue throughout adult life.

Sexual Interactions

Many early social interactions tend to be nonsexual—text

messaging, phone calls, email—but by the age of 12 or 13, some young people may pair off and begin dating and experimenting with kissing, touching, and other physical contact, such as oral sex. The vast majority of young adolescents are not prepared emotionally or physically for oral sex and sexual intercourse. If adolescents this young do have sex, they are highly vulnerable to sexual and emotional abuse, **sexually transmitted infections (STIs)**, HIV, and early pregnancy. For STI's in particular, adolescents are slower to recognize symptoms, tell partners, and get medical treatment, which puts them at risk of infertility and even death.

Adolescents ages 14 to 16 understand the consequences of unprotected sex and teen parenthood, if properly taught, but cognitively they may lack the skills to integrate this knowledge into everyday situations or consistently to act responsibly in the heat of the moment. By the age of 17, many adolescents have willingly experienced sexual intercourse. Teens who have early sexual intercourse report strong peer pressure as a reason behind their decision. Some adolescents are just curious about sex and want to experience it.

Becoming a sexually healthy adult is a developmental task of adolescence that requires integrating psychological, physical, cultural, spiritual, societal, and educational factors. It is particularly important to understand the adolescent in terms of his or her physical, emotional, and cognitive stage. Additionally, healthy adult relationships are more likely to develop when adolescent impulses are not shamed or feared. Guidance is certainly needed, but acknowledging that adolescent sexuality development is both normal and positive would allow for more open communication so adolescents can be more receptive to education concerning the risks (Tolman & McClelland, 2011).

Adolescents are receptive to their culture, to the models they see at home, in school, and in the mass media. These observations influence moral reasoning and moral behavior, which we discuss in more detail later in this module. Decisions regarding sexual behavior are influenced by teens' ability to think and reason, their

values, and their educational experience. Helping adolescents recognize all aspects of sexual development encourages them to make informed and healthy decisions about sexual matters.

Teenage Sexual Activity Trends

Teenagers are much more sexually active today than they were before the sexual revolution of the 1960s and 70s. About 43 percent of never-married teens ages 15–19 of both sexes have had sexual intercourse (Martinez et al., 2011); this percentage represents a drop from its highest point, in 1988, of 51 percent for females and of 60 percent for males. About three-fourths of girls in today's sexually experienced group and 85 percent of boys in this group use contraception, most often a condom, the first time they ever have sex. In their most recent act of sexual intercourse, almost 86 percent of girls and 93 percent of boys used contraception, again most often a condom.

If 43 percent of teens have had sexual intercourse, that means the majority of teens, 57 percent, have never had intercourse. It is interesting to examine their reasons. The table below identifies the main reason given for never having sexual intercourse. The top reason for both sexes is religion and morals, followed by concern about a possible pregnancy and not having found the right person with whom to have sex (Martinez et al., 2011).

Table 1. Main Reason Given for Never Having Sexual Intercourse, Ages 15–19 (%)

	Females	Males
Against religion or morals	38	31
Don't want to get (a female) pregnant	19	25
Haven't found the right person yet	17	21
Don't want to get an STI	7	10
In a relationship, but waiting for the right time	7	5
Other reason	12	8

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The Problem of Teenage Pregnancy

Most teenage pregnancies and births are unplanned and are part of a more general problem for all women in their childbearing years. Almost 700,000 unplanned teenage pregnancies occur annually; another 50,000 teenage pregnancies are planned. These 750,000 teenage pregnancies annually result in some 400,000 births (Kost, Henshaw, & Carlin, 2010). Altogether, about 18 percent of women, or one of every six females, become teen mothers, and in several southern and southwestern states, this percentage is as high as 25–30 percent (Perper & Manlove, 2009).

The birth rate for females aged 15–19 in 2009 was 39.1 births per 1,000 females. This rate represented a substantial decline from the early 1990s when the rate reached a peak of almost 60. However, it

was still twice as high as Canada's rate and much higher yet than other Western democracies (Figure 1).

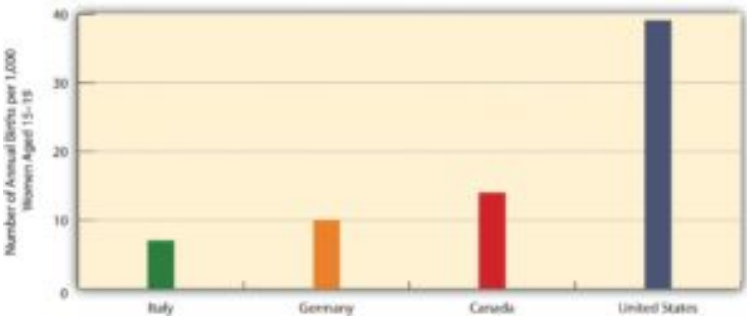

Figure 1. Teenage Birth Rates in Selected Western Democracies

Although teenaged pregnancies (and births from these pregnancies) are far from the majority of all pregnancies, unplanned or planned, they pose special problems (American College of Obstetricians and Gynecologists, 2011; Anderson, 2011). On the individual level, pregnant teenagers are more at risk than older pregnant women for high blood pressure and anemia, and they are also more likely to experience early labor, premature birth, and low birth weight. In addition, because teenagers are more likely than adults to have STIs, pregnant teenagers are more likely than older pregnant women to have an STI while they are pregnant, either because they already had an STI when they conceived or because they contract an STI from having sex during pregnancy.

Many pregnant teenagers decide to drop out of school. If they stay in school, they often must deal with the embarrassment of being pregnant, and the physical and emotional difficulties accompanying their teenage pregnancy can affect their school performance. Once the baby is born, child care typically becomes an enormous problem, whether or not the new mother is in school. Because pregnant teenagers disproportionately come from families

that are poor or near-poor, they have few financial resources and often have weak social support networks, either before or after the baby is born (Andrews & Moore, 2011).

At the societal level, teenage pregnancy and motherhood are very costly in at least two important respects. First, because pregnancy and childbirth complications are more common among teenagers, their health-care expenses during and after pregnancy and childbirth are often higher than the expenses incurred by older women. Medicaid, the federal government's national health plan for poor families, often covers much of these expenses, and the premiums that private health insurance companies charge are higher than otherwise because of their expenses when they insure the families of pregnant teenagers.

Second, the children of teenage mothers are at risk for several kinds of behavioral and developmental problems. Teenage parents may be unprepared emotionally or practically to raise a child. Children of teen parents may receive less cognitive stimulation and proper emotional support. In addition, the stress they experience as young parents put them at risk of neglecting or abusing their children. Teenage parents also tend to come from low-income families and continue to live in poverty or near poverty after they become mothers compounds all these problems. For all these reasons, the children of teenage mothers are at greater risk for several kinds of issues. These problems include impaired neurological development, behavioral problems, poor school performance, and chronic health problems.

Reducing Teenage Pregnancy

In an effort to reduce teenage pregnancies, two approaches have been used: (1) Emphasize abstinence, convincing teens to hold off on having sex until adulthood or marriage, and (2) comprehensive sex education, including teaching the effective use of contraception

if they do have sex. Most sexual behavior researchers believe that pleas for abstinence, as well as sex education programs that focus solely or almost entirely on abstinence, do not help to reduce teen sex and pregnancy (Ball & Moore, 2008).

Comprehensive sex education is based on the strategy of harm reduction. A harm reduction approach recognizes that because certain types of harmful behavior are inevitable, our society should do its best to minimize the various kinds of harm that these various behaviors generate. In regard to teenage sex and pregnancy, a harm reduction approach has two goals: (1) to help reduce the risk for pregnancy among sexually active teens and (2) to help teenage parents and their children.

To achieve the first goal, parents, sex education classes, family planning clinics, youth development programs, and other parties must continue to emphasize the importance of waiting to have sex but also the need for teenagers to use contraception if they are sexually active. In addition, effective contraception (birth control pills, other hormonal control, and even condoms, which protect against STIs) must be made available for teenagers at little or no cost. Studies indicate that these two contraception strategies do not lead to more teenage sex, and they also indicate that consistent contraceptive use dramatically reduces the risk of teenage pregnancy. As one writer has summarized these studies' conclusions, "Contraceptives no more cause sex than umbrellas cause rain…When contraception is unavailable, the likely consequences is not less sex, but more pregnancy" (Kristof, 2011, p. A31).

In this regard, a recent report of the Guttmacher Institute called contraception a "proven, cost-effective strategy" (Gold, 2011, p. 7). It added, "Contraception is almost universally accepted as a way to reduce the risk of unintended pregnancy…Contraceptive use reduces the risk of unintended pregnancy significantly, and consistent contraceptive use virtually eliminates it." The report noted that government-funded family planning agencies prevent 2 million unintended pregnancies annually by providing

contraception to 9 million young and low-income women each year. Because most of the women who would have these prevented pregnancies would be eligible for Medicaid, the Medicaid savings from these prevented pregnancies amount to about $7 billion annually. An expansion of family planning services would almost certainly be an effective strategy for reducing teenage pregnancies as well as unplanned pregnancies among older women.

Another strategy to prevent teenage pregnancy involves the use of early childhood intervention (ECI) programs. Many such programs exist, but they generally include visits by social workers, nurses, and other professionals to the homes of children who are at risk for neurological, emotional, and/or behavioral problems during their first several years and also as they grow into adolescents and young adults (Kahn & Moore, 2010). It might sound like a stereotype, but these children are disproportionately born to single, teenage mothers and/or to slightly older parents who live in poverty or near poverty. Long-term evaluation studies show that the best of these programs reduce the likelihood that the very young children they help will become pregnant or have children of their own after they become teenagers (Ball & Moore, 2008). In effect, assisting young children to today helps prevent teenage pregnancy tomorrow.

The second prong to this harm reduction strategy targets teenage parents and their children. Because teen pregnancies occur despite the best prevention efforts, the second goal of a harm reduction approach is to help teens during their pregnancy and after childbirth. This strategy has the immediate aim of providing practical and emotional support for these very young mothers; it also has the longer-term goals of reducing repeat pregnancies and births and of preventing developmental and behavior problems among their children.

To achieve these aims, Early Childhood Intervention programs have again been shown to be helpful (Ball & Moore, 2008). Another type of program to help teen mothers involves the use of second-chance homes, which are maternity group homes for unmarried teen mothers (Andrews & Moore, 2011). One of the many sad facts

of teenage motherhood is that teen mothers often have nowhere to live. A teen mother's parent(s) may refuse to let her and her infant live with them, either because they are angry at her pregnancy or because they simply do not have the room or financial means to house and take care of a baby. Or a pregnant teen may decide to leave her parents' home because of the parents' anger or because they refuse to let her continue seeing the child's father. In another possibility, a teen mother may begin living with the father, but these unions are typically unstable and often end, again leaving her and her child without a home. As well, many teen mothers were runaways from home before they became pregnant or were living in foster care. Because of all these situations, many teen mothers find themselves without a place to live.

In second-chance homes (which, depending on the program, are in reality one large house, a set of apartments, or a network of houses), mothers and children (as well as pregnant teens) receive shelter and food, but they also receive essential services, such as childrearing help, educational and vocational counseling and training, family planning counseling, and parenting classes. Although rigorous evaluation studies do not yet exist on the effectiveness of second-chance homes, they do seem to offer a valuable resource for teen mothers and their children (Andrews & Moore, 2011).

A final strategy for addressing the problem of teenage sex and pregnancy is to address a more general societal condition that helps produce teenage sex and pregnancy. This condition is poverty. As noted earlier, children who grow up in poor families and in disadvantaged neighborhoods—those with high rates of poverty, unemployment, high school dropouts, and so forth—are more likely to have sex earlier as teens and to become pregnant (Harding, 2003; Scott, Steward-Streng, Barry, & Manlove, 2011).

Sexually Transmitted Infections

In addition to pregnancy and birth, another problem associated with teenage sexual activity is the transmission of sexually transmitted infections (STIs). This is a problem during the teenage years, but it is even more of a problem during young adulthood, when sexual activity is higher than during adolescence (Wildsmith, Schelar, Peterson, & Manlove, 2010). The STI rate in the United States is higher than in most other Western democracies. Almost 19 million new cases of STIs are diagnosed annually, and more than 65 million Americans have an incurable STI, such as herpes. Although teens and young adults ages 15–24 compose only one-fourth of sexually active people, they account for one-half of all new STIs. Despite this fact, most young adults who test positive for an STI did not believe they were at risk of getting an STI (Wildsmith et al., 2010).

In any one year, 15 percent of young adults ages 18 and 26 have an STI. This figure masks a significant gender difference: 20 percent of young women have had an STI in the past year, compared to 10 percent of young men. It also masks important racial/ethnic differences: 34 percent of young African Americans have had an STI in the past year, compared to 10 percent of Asians, 15 percent of Hispanics, and 10 percent of whites.

Three types of sexual behaviors increase the risk of transmitting or contracting an STI: having sex with at least three partners during the past year, having a sex partner with a known STI, and not using a condom regularly. About 17 percent of sexually active young adults have had at least three partners during the past year, and 8 percent have had a partner with a known STI. Three-fourths of unmarried sexually active young adults do not use a condom regularly. Combining all these risk factors, 39 percent have engaged in one risk factor in the past year, 14 percent have engaged in at least two risk factors, and the remainder, 48 percent, have engaged in no risk factors (Wildsmith et al., 2010).

Think About It

1. Imagine that you became a parent at age 17. How would your life have been different from what it is now?
2. Many sexually active teenagers do not use contraception regularly. Why do you think they do not use it more often?

Health and Nutrition

Immunizations

Preventing communicable diseases from early infancy is one of the major tasks of the Public Health System in the USA. Infants mouth every single object they find as one of their typical developmental tasks. They learn through their senses and tasting objects stimulates their brain and provides a sensory experience as well as learning.

Infants have much contact with dirty surfaces. They lay on a carpet that most likely has been contaminated by adults walking on it; they mouth keys, rattles, toys, and books; they crawl on the floor; they hold on to furniture to walk, and much more. How do we prevent infants from getting sick? One possible answer is **immunizations**.

Watch It

Video 1. Watch the selected first ten minutes of this video clip from the Alexander Street Database that illustrates what now has become the vaccine war.

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Many decades ago, our society struggled to find vaccines and cures for illnesses such as Polio, whooping cough, and many other medical conditions. A few decades ago parents started changing their minds on the need to vaccinate children. Some children are not vaccinated for valid medical reasons, but some states allow a child to be unvaccinated because of a parent's personal or religious beliefs. At least 1 in 14 children is not vaccinated. What is the outcome of not vaccinating children? Some of the preventable illnesses are returning. Fortunately, each vaccinated child stops the transmission of the disease, a phenomenon called *herd immunity*. Usually, if 90% of the people in a community (a herd) are immunized, no one dies of that disease.

In 2017, Community Care Licensing in California, the agency that regulates childcare centers, changed regulations. Before it was possible for parents to opt-out of vaccinations due to personal beliefs, but this changed after Governor Brown signed a Bill in 2016 to only exclude children from being vaccinated if there were medical reasons. Furthermore, all personnel working with children must be immunized.

Link to Learning

Read more information about vaccinations at the website **Shots for School.**

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Infant Nutrition

Good nutrition in a supportive environment is vital for an infant's healthy growth and development. Remember, from birth to 1 year, infants triple their weight and increase their height by half, and this growth requires good nutrition. For the first 6 months, babies are fed breast milk or formula. Starting good nutrition practices early can help children develop healthy dietary patterns. Infants need to receive nutrients to fuel their rapid physical growth. **Malnutrition** during infancy can result in not only physical but also cognitive and social consequences. Without proper nutrition, infants cannot reach their physical potential.

Breastfeeding

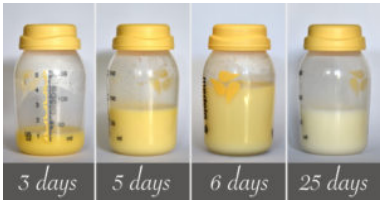

Figure 1. *Breastmilk changes in composition with a newborn's development and needs.*

Breast milk is considered the ideal diet for newborns due to the nutrition makeup of colostrum and subsequent breastmilk production. **Colostrum,** the milk produced during pregnancy and just after birth, has been described as "liquid gold. Colostrum is packed with nutrients and other important substances that help the infant build up his or her immune system. Most babies will get all the nutrition they need through colostrum during the first few days of life (CDC, 2018). Breast milk changes by the third to fifth day after birth, becoming much thinner, but containing just the right amount of fat, sugar, water, and proteins to support overall physical and neurological development. It provides a source of iron more easily absorbed in the body than the iron found in dietary supplements, it provides resistance against many diseases, it is more easily digested by infants than formula, and it helps babies make a transition to solid foods more easily than if bottle-fed.

The reason infants need such a high-fat content is the process of myelination which requires fat to insulate the neurons. Therefore, there has been some research, including meta-analyses, to show that breastfeeding is connected to advantages with cognitive development (Anderson, Johnstone, & Remley, 1999). Low birth weight infants had the greatest benefits from breastfeeding than did normal-weight infants in a meta-analysis that of twenty controlled studies examining the overall impact of breastfeeding (Anderson et al., 1999). This meta-analysis showed that breastfeeding may provide nutrients required for rapid development of the immature brain and be connected to more rapid or better development of neurologic

function. The studies also showed that a longer duration of breastfeeding was accompanied by greater differences in cognitive development between breastfed and formula-fed children. Whereas normal-weight infants showed a 2.66-point difference, low-birth-weight infants showed a 5.18-point difference in IQ compared with weight-matched, formula-fed infants (Anderson et al, 1999). These studies suggest that nutrients present in breast milk may have a significant effect on neurologic development in both premature and full-term infants.

For most babies, breast milk is also easier to digest than formula. Formula-fed infants experience more diarrhea and upset stomachs. The absence of antibodies in formula often results in a higher rate of ear infections and respiratory infections. Children who are breastfed have lower rates of childhood leukemia, asthma, obesity, type 1 and 2 diabetes, and a lower risk of SIDS. For all of these reasons, it is recommended that mothers breastfeed their infants until at least 6 months of age and that breast milk be used in the diet throughout the first year (U.S. Department of Health and Human Services, 2004a in Berk, 2007).

Several recent studies have reported that it is not just babies that benefit from breastfeeding. Breastfeeding stimulates contractions in the uterus to help it regain its normal size, and women who breastfeed are more likely to space their pregnancies farther apart. Mothers who breastfeed are at lower risk of developing breast cancer, especially among higher-risk racial and ethnic groups (Islami et al., 2015). Other studies suggest that women who breastfeed have lower rates of ovarian cancer (Titus-Ernstoff, Rees, Terry, & Cramer, 2010), and reduced risk for developing Type 2 diabetes (Gunderson, et al., 2015), and rheumatoid arthritis (Karlson, Mandl, Hankinson, & Grodstein, 2004).

A historic look at breastfeeding

The use of wet nurses, or lactating women, hired to nurse others' infants, during the middle ages eventually declined, and mothers increasingly breastfed their own infants in the late 1800s. In the early part of the 20th century, breastfeeding began to go through another decline, and by the 1950s it was practiced less frequently by middle class, more affluent mothers as formula began to be viewed as superior to breast milk. In the late 1960s and 1970s, there was again a greater emphasis placed on natural childbirth and breastfeeding and the benefits of breastfeeding were more widely publicized. Gradually, rates of breastfeeding began to climb, particularly among middle-class educated mothers who received the strongest messages to breastfeed.

Today, new mothers receive consultation from lactation specialists before being discharged from the hospital to ensure that they are informed of the benefits of breastfeeding and given support and encouragement to get their infants accustomed to taking the breast. This does not always happen immediately, and first-time mothers, especially, can become upset or discouraged. In this case, lactation specialists and nursing staff can encourage the mother to keep trying until the baby and mother are comfortable with the feeding.

Most mothers who breastfeed in the United States stop breastfeeding at about 6-8 weeks, often in order to return to work outside the home (United States Department of Health and Human Services (USDHHS), 2011). Mothers can certainly continue to

provide breast milk to their babies by expressing and freezing the milk to be bottle fed at a later time or by being available to their infants at feeding time, but some mothers find that after the initial encouragement they receive in the hospital to breastfeed, the outside world is less supportive of such efforts. Some workplaces support breastfeeding mothers by providing flexible schedules and welcoming infants, but many do not. And the public support of breastfeeding is sometimes lacking. Women in Canada are more likely to breastfeed than are those in the United States, and the Canadian health recommendation is for breastfeeding to continue until 2 years of age. Facilities in public places in Canada such as malls, ferries, and workplaces provide more support and comfort for the breastfeeding mother and child than found in the United States.

In addition to the nutritional and health benefits of breastfeeding, breast milk is free! Anyone who has priced formula recently can appreciate this added incentive to breastfeeding. Prices for a month's worth of formula can easily range from $130-$200. Prices for a year's worth of formula and feeding supplies can cost well over $1,500 (USDHHS, 2011).

Links to Learning

- Watch this video from the Psych SciShow "Bad Science: Breastmilk and Formula" to learn about research related to both breastfeeding and formula-feeding.
- To learn more about breastfeeding, visit this resource from the U.S. Department of Health and Human Resources: Your Guide to Breastfeeding.
- Visit Kids Health on Breastfeeding vs. Formula Feeding to learn more about the benefits and

challenges of each. Click on the speaker icon to listen to the narration of the article if you would like.

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When Breastfeeding Doesn't Work

There are occasions where mothers may be unable to breastfeed babies, often for a variety of health, social, and emotional reasons. For example, breastfeeding generally does not work:

- when the baby is adopted
- when the biological mother has a transmissible disease such as tuberculosis or HIV
- when the mother is addicted to drugs or taking any medication that may be harmful to the baby (including some types of birth control)
- when the infant was born to (or adopted by) a family with two fathers and the surrogate mother is not available to breastfeed
- when there are attachment issues between mother and baby
- when the mother or the baby is in the Intensive Care Unit (ICU) after the delivery process
- when the baby and mother are attached but the mother does

not produce enough breast-milk

One early argument given to promote the practice of breastfeeding (when health issues are not the case) is that it promotes bonding and healthy emotional development for infants. However, this does not seem to be a unique case. Breastfed and bottle-fed infants adjust equally well emotionally (Ferguson & Woodward, 1999). This is good news for mothers who may be unable to breastfeed for a variety of reasons and for fathers who might feel left out as a result.

Introducing Solid Foods

Breast milk or formula is the only food a newborn needs, and the American Academy of Pediatrics recommends exclusive breastfeeding for the first six months after birth. Solid foods can be introduced from around six months onward when babies develop stable sitting and oral feeding skills but should be used only as a supplement to breast milk or formula. By six months, the gastrointestinal tract has matured, solids can be digested more easily, and allergic responses are less likely. The infant is also likely to develop teeth around this time, which aids in chewing solid food. Iron-fortified infant cereal, made of rice, barley, or oatmeal, is typically the first solid introduced due to its high iron content. Cereals can be made of rice, barley, or oatmeal. Generally, salt, sugar, processed meat, juices, and canned foods should be avoided.

Though infants usually start eating solid foods between 4 and 6 months of age, more and more solid foods are consumed by a growing toddler. Pediatricians recommended introducing foods one at a time, and for a few days, in order to identify any potential food allergies. Toddlers may be picky at times, but it remains important to introduce a variety of foods and offer food with essential vitamins and nutrients, including iron, calcium, and vitamin D.

Milk Anemia in the United States

About 9 million children in the United States are malnourished (Children's Welfare, 1998). More still suffer from **milk anemia**, a condition in which milk consumption leads to a lack of iron in the diet. The prevalence of iron deficiency anemia in 1- to 3-year-old children seems to be increasing (Kazal, 2002). The body gets iron through certain foods. Toddlers who drink too much cow's milk may also become anemic if they are not eating other healthy foods that have iron. This can be due to the practice of giving toddlers milk as a pacifier when resting, riding, walking, and so on. Appetite declines somewhat during toddlerhood and a small amount of milk (especially with added chocolate syrup) can easily satisfy a child's appetite for many hours. The calcium in milk interferes with the absorption of iron in the diet as well. There is also a link between iron deficiency anemia and diminished mental, motor, and behavioral development. In the second year of life, iron deficiency can be prevented by the use of a diversified diet that is rich in sources of iron and vitamin C, limiting cow's milk consumption to less than 24 ounces per day, and providing a daily iron-fortified vitamin.

Global Considerations and Malnutrition

***Figure 2**. These children are showing the extended abdomen characteristic of kwashiorkor (Photo Courtesy CDC).*

In the 1960s, formula companies led campaigns in developing countries to encourage mothers to feed their babies on infant formula. Many mothers felt that formula would be superior to breast milk and began using formula. The use of formula can certainly be healthy under conditions in which there is adequate, clean water with which to mix the formula and adequate means to sanitize bottles and nipples. However, in many of these countries, such conditions were not available and babies often were given diluted, contaminated formula which made them become sick with diarrhea and become dehydrated. These conditions continue today and now many hospitals prohibit the distribution of formula samples to new mothers in efforts to get them to rely on breastfeeding. Many of these mothers do not understand the benefits of breastfeeding and have to be encouraged and supported in order to promote this practice.

The World Health Organization (2018) recommends:

- initiation of breastfeeding within one hour of birth
- exclusive breastfeeding for the first six months of life
- introduction of solid foods at six months together with continued breastfeeding up to two years of age or beyond

Link to Learning

Breastfeeding could save the lives of millions of infants each year, according to the World Health Organization (WHO), yet fewer than 40 percent of infants are breastfed exclusively for the first 6 months of life. Most women can breastfeed unless they are receiving chemotherapy or radiation therapy, have HIV, are dependent on illicit drugs, or have active untreated tuberculosis. Because of the great benefits of breastfeeding, WHO, UNICEF, and other national organizations are working together with the government to step up support for breastfeeding globally.

Find out more statistics and recommendations for breastfeeding at the WHO's 10 facts on breastfeeding. You can also learn more about efforts to promote breastfeeding in Peru: "Protecting Breastfeeding in Peru".

Children in developing countries and countries experiencing the harsh conditions of war are at risk for two major types of malnutrition. **Infantile marasmus** refers to starvation due to a lack of calories and protein. Children who do not receive adequate nutrition lose fat and muscle until their bodies can no longer function. Babies who are breastfed are much less at risk of malnutrition than those who are bottle-fed. After weaning, children who have diets deficient in protein may experience **kwashiorkor,** or the "disease of the displaced child," often occurring after another child has been born and taken over breastfeeding. This results in a loss of appetite and swelling of the abdomen as the body begins to break down the vital organs as a source of protein.

Watch It

Video 2. Watch this video to learn more about the signs and symptoms of kwashiorkor and marasmus.

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Nutritional Concerns in Childhood

Figure 3. *While young children can be picky eaters, it is important to expose them to a variety of healthy foods and avoid too many high-fat or low-nutritional foods, such as corndogs.*

According to the Centers for Disease Control and Prevention (CDC), 1 in 5 American children between the ages of 2 and 5 are overweight or obese. The American Academy of Pediatrics (AAP) recommends a number of steps to take to help reduce the chances of obesity in young children. Removing high-calorie low-nutrition foods from the diet, offering whole fruits and vegetables instead of just juices, and getting kids active are just some of the recommendations that they make. Muckelbauer and colleagues (2009) found that increasing water consumption in school-aged children by just 220ml (just under 8 oz) per day decreased the risk of obesity by 31%. Finally, the AAP suggests that parents can begin offering milk with a lower fat percentage (2%, 1%, or skim milk) to 2-year-olds. The switch to lower fat milk may help avoid some of the obesity issues discussed above. Parents should avoid giving the child too much milk as calcium interferes with the absorption of iron in the diet as well.

Caregivers (whether parents or non-parents) need to keep in mind that they are setting up taste preferences at this age. Young children who grow accustomed to high-fat, very sweet, and salty flavors may have trouble eating foods that have more subtle flavors such as fruits and vegetables. Lack of a healthy diet may lead to obesity during this and future stages. Offering a diet of diverse food options, limiting foods with high calories but low nutritional value, and limiting high-calorie drink options can all contribute greatly to a child's health during this stage of life.

Caregivers who have established a feeding routine with their child

can find the normal reduction in appetite a bit frustrating and become concerned that the child is going to starve. However, by providing adequate, sound nutrition, and limiting sugary snacks and drinks, the caregiver can be assured that 1) the child will not starve, and 2) the child will receive adequate nutrition. Preschoolers can experience iron deficiencies if not given well-balanced nutrition.

Tips for Establishing Healthy Eating Patterns

Consider the following advice about establishing eating patterns for years to come (Rice, F.P., 1997). Notice that keeping mealtime pleasant, providing sound nutrition, and not engaging in power struggles over food are the main goals.

1. Don't try to force your child to eat or fight over food. Of course, it is impossible to force someone to eat. But the real advice here is to avoid turning food into some kind of ammunition during a fight. Do not teach your child to eat to or refuse to eat in order to gain favor or express anger toward someone else.

2. Recognize that appetite varies. Children may eat well at one meal and have no appetite at another. Rather than seeing this as a problem, it may help to realize that appetites do vary. Continue to provide good nutrition, but do not worry excessively if the child does not eat.

3. Keep it pleasant. This tip is designed to help caregivers create a positive atmosphere during mealtime. Mealtimes should not be the time for

arguments or expressing tensions. You do not want the child to have painful memories of mealtimes together or have nervous stomachs and problems eating and digesting food due to stress.

4. No short-order chefs. While it is fine to prepare foods that children enjoy, preparing a different meal for each child or family member sets up an unrealistic expectation from others. Children probably do best when they are hungry and a meal is ready. Limiting snacks rather than allowing children to "graze" continuously can help create an appetite for whatever is being served.

5. Limit choices. If you give your preschool-aged child choices, make sure that you give them one or two specific choices rather than asking "What would you like for lunch?" If given an open choice, children may change their minds or choose whatever their sibling does not choose!

6. Serve balanced meals. This tip encourages caregivers to serve balanced meals. A box of macaroni and cheese is not a balanced meal. Meals prepared at home tend to have better nutritional value than fast food or frozen dinners. Prepared foods tend to be higher in fat and sugar content as these ingredients enhance taste and profit margin because fresh food is often more costly and less profitable. However, preparing fresh food at home is not costly. It does, however, require more activity. Preparing meals and including the children in kitchen

chores can provide a fun and memorable experience.

7. Don't bribe. Bribing a child to eat vegetables by promising dessert is not a good idea. For one reason, the child will likely find a way to get the desert without eating the vegetables (by whining or fidgeting, perhaps, until the caregiver gives in), and for another reason, because it teaches the child that some foods are better than others. Children tend to naturally enjoy a variety of foods until they are taught that some are considered less desirable than others. A child, for example, may learn the broccoli they have enjoyed is seen as yucky by others unless it's smothered in cheese sauce!

To what extent do these tips address cultural practices? How might these tips vary by culture?

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Childhood Obesity

Nearly 20 percent of school-aged American children are obese. This

is defined as being at least 20 percent over their ideal weight. The percentage of obesity in school-aged children has increased substantially since the 1960s, and it continues to increase. This is true in part because of the introduction of a steady diet of television and other sedentary activities. In addition, we have come to emphasize high fat, fast foods as a culture. Pizza, hamburgers, chicken nuggets, and "Lunchables" with soda have replaced more nutritious foods as staples.

School Lunches

School lunches must meet the applicable recommendations of the Dietary Guidelines for Americans. These guidelines state that no more than 30 percent of an individual's calories should come from fat and less than 10 percent from saturated fat. Regulations also state that school lunches must provide one-third of the recommended dietary allowances of protein, Vitamin A, Vitamin C, iron, calcium, and calories. School lunches must meet federal nutrition requirements over the course of one week's worth of lunches. However, local school food authorities may make decisions about which specific foods to serve and how they are prepared.

Many children in the United States buy their lunches in the school cafeteria, so it might be worthwhile to look at the nutritional content of school lunches. You can obtain this information through your local school district's website. An example of a school menu and nutritional analysis from a school district in north-central Texas is a meal consisting of pasta alfredo, breadstick, peach cup, tomato soup, and a brownie, and 2% milk. Students may

also purchase chips, cookies, or ice cream along with their meals. Many school districts rely on the sale of dessert and other items in the lunchrooms to make additional revenues and many children purchase these additional items so our look at their nutritional intake should also take this into consideration.

Consider another menu from an elementary school in the state of Washington. This sample meal consists of a chicken burger, tater tots, fruit and veggies, and 1% or nonfat milk. This meal is also in compliance with Federal Nutrition Guidelines but has about 300 fewer calories. And, children are not allowed to purchase additional desserts such as cookies or ice cream.

Michelle Obama has been a recent advocate for nutritional school lunches. Since the Healthy, Hunger-Free Act of 2010, she has worked diligently to defend the importance of healthy school lunches but has largely not been successful in her efforts. Schools in the United States are having difficulty enforcing nutrition values in fear of being wasteful because some of the new standards such as whole grains, more vegetables, and reduced sodium levels initially resulted in fewer children eating their lunches. Children are eating 16% more vegetables and 23% more fruit during lunches, and over 90% of schools report that they are meeting the new nutritional guidelines.

One consequence of childhood obesity is that children who are overweight tend to be ridiculed and teased by others. This can certainly be damaging to their self-image and popularity. In addition, obese children run the risk of suffering orthopedic problems such as knee injuries, and an increased risk of heart disease and stroke in adulthood. It may be difficult for a child who

is obese to become a non-obese adult. In addition, the number of cases of pediatric diabetes has risen dramatically in recent years.

Dieting is not really the solution to childhood obesity. If your diet, your basal metabolic rate tends to decrease thereby making the body burn even fewer calories in order to maintain the weight. Increased activity is much more effective in lowering the weight and improving the child's health and psychological well-being. Exercise reduces stress and being an overweight child, subjected to the ridicule of others can certainly be stressful. Parents should take caution against emphasizing diet alone to avoid the development of any obsession about dieting that can lead to eating disorders as teens. Again, increasing a child's activity level is most helpful.

Exercise and Sports

***Figure 4**. Organized sports like soccer are especially popular during middle childhood.*

Middle childhood seems to be a great time to introduce children to organized sports, and in fact, many parents do. Nearly 3 million children play soccer in the United States (United States Youth Soccer, 2012). This activity promises to help children build social skills, improve athletically, and learn a sense of competition. However, it has been suggested that the emphasis on competition and athletic abilities can be counterproductive and lead children to grow tired of the game and want to quit. In many respects, it appears that children's activities are no longer children's activities once adults become involved and approach the games as adults rather than children. The U. S. Soccer Federation recently advised coaches to reduce the amount of drilling engaged in during practice and to allow children to play more freely and to choose their own positions.

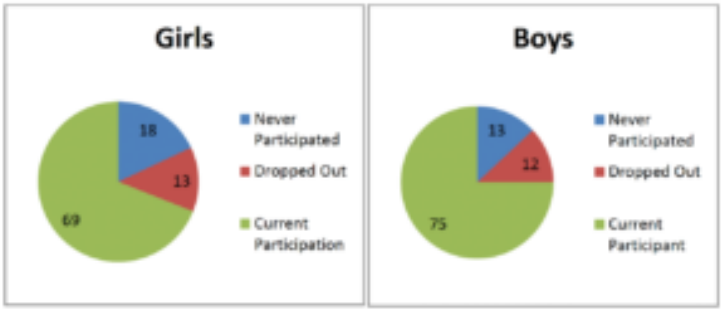
The hope is that this will build on their love of the game and foster their natural talents.

Sports are important for children. Children's participation in sports has been linked to:

- Higher levels of satisfaction with family and overall quality of life in children
- Improved physical and emotional development
- Better academic performance

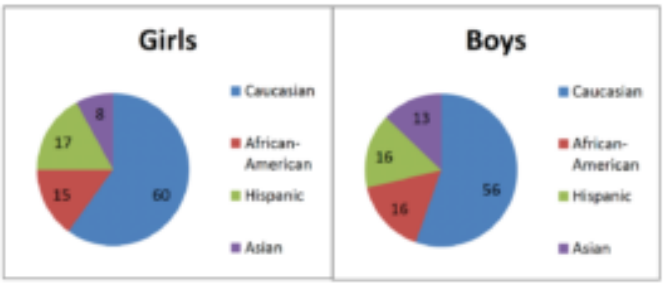
Yet, a study on children's sports in the United States (Sabo & Veliz, 2008) has found that gender, poverty, location, ethnicity, and disability can limit opportunities to engage in sports. Girls were more likely to have never participated in any type of sport (see Figure 5). They also found that fathers may not be providing their daughters as much support as they do their sons.

While boys rated their fathers as their biggest mentor who taught them the most about sports, girls rated coaches, and physical education teachers as their key mentors. Sabo and Veliz also found that children in suburban neighborhoods had much higher participation in sports than boys and girls living in rural or urban centers. In addition, Caucasian girls and boys participated in organized sports at higher rates than minority children (see Figure 6).



Total girls (n=1051), Total boys (n=1081)
t-test comparing gender and students who have never participated in sports. t=-3.038**, p=.002, df=2130

Figure 5. Participation in organized sports (%) by gender.



Girls – Caucasian (n=425); African-American (n=106); Hispanic (n=124); Asian (n=55)
Boys – Caucasian (n=435); African-American (n=127); Hispanic (n=123); Asian (n=99)

Figure 6. Participation in organized sports (%) by race and ethnicity.

Finally, Sabo and Veliz asked children who had dropped out of organized sports why they left. For both girls and boys, the number one answer was that it was no longer any fun (see Table 1). According to the Sports Policy and Research Collaborative (SPARC) (2013), almost 1 in 3 children drop out of organized sports, and while there are many factors involved in the decisions to drop out, one suggestion has been the lack of training that coaches of children's sports receive may be contributing to this attrition (Barnett, Smoll & Smith, 1992). Several studies have found that when coaches receive proper training, the drop-out rate is about 5% instead of the usual 30% (Fraser-Thomas, Côté, & Deakin, 2005; SPARC, 2013).

Table 1. Top reasons dropped out or stopped playing organized sports by gender

Girls		Boys	
I was not having fun	38%	I was not having fun	39%
I wanted to focus more on studying and grades	36%	I had a health problem or injury	29%
I had a health problem or injury	27%	I wanted to focus more on studying and grades	26%
I wanted to focus more on other clubs or activities	22%	I did not like or get along with the coach	22%
I did not like or get along with the coach	18%	I wanted to focus more on other clubs or activities	18%
I did not like or get along with others on the team	16%	I did not like or get along with others on the team	16%
I was not a good enough player	15%	I was not a good enough player	15%
My family worried about me getting hurt or injured while playing sports	14%	My family worried about me getting hurt or injured while playing sports	12%

Source: Sabo, D., & Veliz, P. (2008). Go Out and Play: Youth Sports in America. East Meadows, NY: Women's Sports

Welcome to the World of E-Sports

The recent SPARC (2016) report on the "State of Play" in the United States highlights a disturbing trend. One in four children between the ages of 5 and 16 rate playing computer games with their friends as a form of exercise. In addition, **e-sports**, which as SPARC writes, is about as much a sport as poker, *involves children watching other children play video games*. over half of males, and about 20% of females, aged 12-19, say they are fans of e-sports.

Since 2008 there has also been a downward trend in the number of sports children are engaged in, despite a body of research evidence that suggests that specializing in only one activity can increase the chances of injury while playing multiple sports is protective (SPARC, 2016). A University of Wisconsin study found that 49% of athletes who specialized in a sport experienced an injury compared with 23% of those who played multiple sports (McGuine, 2016).

Physical Education

For many children, physical education in school is a key component in introducing children to sports. After years of schools cutting back on physical education programs, there has been a turnaround, prompted by concerns over childhood obesity and related health issues. Despite these changes, currently, only the state of Oregon and the District of Columbia meet PE guidelines of a minimum of 150 minutes per week of physical activity in elementary school and 225 minutes in middle school (SPARC, 2016).

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Nutrition Concerns During Adolescence

Adequate adolescent nutrition is necessary for optimal growth and development. Dietary choices and habits established during adolescence greatly influence future health, yet many studies report that teens consume few fruits and vegetables and are not receiving the calcium, iron, vitamins, or minerals necessary for healthy development.

One of the reasons for poor nutrition is anxiety about **body image,** which is a person's idea of how his or her body looks. The way adolescents feel about their bodies can affect the way they feel about themselves as a whole. Few adolescents welcome their sudden weight increase, so they may adjust their eating habits to

lose weight. Adding to the rapid physical changes, they are simultaneously bombarded by messages, and sometimes teasing, related to body image, appearance, attractiveness, weight, and eating that they encounter in the media, at home, and from their friends/peers (both in-person and via social media).

Much research has been conducted on the psychological ramifications of body image on adolescents. Modern-day teenagers are exposed to more media on a daily basis than any generation before them. Recent studies have indicated that the average teenager watches roughly 1500 hours of television per year, and 70% use social media multiple times a day. As such, modern-day adolescents are exposed to many representations of ideal, societal beauty. The concept of a person being unhappy with their own image or appearance has been defined as "**body dissatisfaction**." In teenagers, body dissatisfaction is often associated with body mass, low self-esteem, and atypical eating patterns. Scholars continue to debate the effects of media on body dissatisfaction in teens. What we do know is that two-thirds of U.S. high school girls are trying to lose weight and one-third think they are overweight, while only one-sixth are actually overweight (MMWR, June 10, 2016).

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Eating Disorders

Dissatisfaction with body image can explain why many teens, mostly

girls, eat erratically or ingest diet pills to lose weight and why boys may take steroids to increase their muscle mass. Although eating disorders can occur in children and adults, they frequently appear during the teen years or young adulthood (NIMH, 2019). Eating disorders affect both genders, although rates among women are 2½ times greater than among men. Similar to women who have eating disorders, some men also have a distorted sense of body image, including **muscle dysmorphia** or an extreme concern with becoming more muscular.

Because of the high mortality rate, researchers are looking into the etiology of the disorder and associated risk factors. Researchers are finding that eating disorders are caused by a complex interaction of genetic, biological, behavioral, psychological, and social factors (NIMH, 2019). Eating disorders appear to run in families, and researchers are working to identify DNA variations that are linked to the increased risk of developing eating disorders. Researchers have also found differences in patterns of brain activity in women with eating disorders in comparison with healthy women. The main criteria for the most common eating disorders: **anorexia nervosa**, **bulimia nervosa**, and **binge-eating disorder** are described in the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition, DSM-5 (American Psychiatric Association, 2013).

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Video 1. *Eating Disorders* explains the symptoms of anorexia

nervosa, bulimia nervosa, and binge-eating disorder, as well as common treatments.

Anorexia Nervosa

People with anorexia nervosa may see themselves as overweight, even when they are dangerously underweight. People with anorexia nervosa typically weigh themselves repeatedly, severely restrict the amount of food they eat, often exercise excessively, and/or may force themselves to vomit or use laxatives to lose weight. Anorexia nervosa has the highest mortality rate of any mental disorder. While many people with this disorder die from complications associated with starvation, others die of suicide.

Symptoms of anorexia nervosa include:

- Extremely restricted eating
- Extreme thinness (emaciation)
- A relentless pursuit of thinness and unwillingness to maintain a normal or healthy weight
- Intense fear of gaining weight
- Distorted body image, a self-esteem that is heavily influenced by perceptions of body weight and shape, or a denial of the seriousness of low body weight

Other symptoms may develop over time, including:

- Thinning of the bones (osteopenia or osteoporosis)
- Mild anemia and muscle wasting and weakness
- Brittle hair and nails
- Dry and yellowish skin
- Growth of fine hair all over the body (lanugo)
- Severe constipation
- Low blood pressure slowed breathing and pulse
- Damage to the structure and function of the heart

- Brain damage
- Multiorgan failure
- Drop-in internal body temperature, causing a person to feel cold all the time
- Lethargy, sluggishness, or feeling tired all the time
- Infertility

For those suffering from anorexia, health consequences include an abnormally slow heart rate and low blood pressure, which increases the risk of heart failure. Additionally, there is a reduction in bone density (osteoporosis), muscle loss and weakness, severe dehydration, fainting, fatigue, and overall weakness. Anorexia nervosa has the highest mortality rate of any psychiatric disorder. Individuals with this disorder may die from complications associated with starvation, while others die of suicide. In women, suicide is much more common in those with anorexia than with most other mental disorders.

Bulimia Nervosa

People with bulimia nervosa have recurrent and frequent episodes of eating unusually large amounts of food and feeling a lack of control over these episodes. This binge-eating is followed by behavior that compensates for overeating such as forced vomiting, excessive use of laxatives or diuretics, fasting, excessive exercise, or a combination of these behaviors. People with bulimia nervosa may be slightly underweight, normal weight, or overweight.

Symptoms of bulimia nervosa include:

- Chronically inflamed and sore throat
- Swollen salivary glands in the neck and jaw area
- Worn tooth enamel and increasingly sensitive and decaying teeth as a result of exposure to stomach acid
- Acid reflux disorder and other gastrointestinal problems

- Intestinal distress and irritation from laxative abuse
- Severe dehydration from purging of fluids
- Electrolyte imbalance (too low or too high levels of sodium, calcium, potassium, and other minerals) which can lead to stroke or heart attack

The binging and purging cycle of bulimia can affect the digestive system and lead to electrolyte and chemical imbalances that can affect the heart and other major organs. Frequent vomiting can cause inflammation and possible rupture of the esophagus, as well as tooth decay and staining from stomach acids. Lastly, binge eating disorder results in similar health risks to obesity, including high blood pressure, high cholesterol levels, heart disease, Type II diabetes, and gall bladder disease (National Eating Disorders Association, 2016).

Binge-Eating Disorder

People with binge-eating disorder lose control over his or her eating. Unlike bulimia nervosa, periods of binge-eating are not followed by purging, excessive exercise, or fasting. As a result, people with binge-eating disorder often are overweight or obese. Binge-eating disorder is the most common eating disorder in the U.S.

Symptoms of binge-eating disorder include:

- Eating unusually large amounts of food in a specific amount of time, such as a 2-hour period
- Eating even when you're full or not hungry
- Eating fast during binge episodes
- Eating until you're uncomfortably full
- Eating alone or in secret to avoid embarrassment
- Feeling distressed, ashamed, or guilty about your eating
- Frequently dieting, possibly without weight loss

Eating Disorders Treatment

To treat eating disorders, getting adequate nutrition, and stopping inappropriate behaviors, such as purging, are the foundations of treatment. Treatment plans are tailored to individual needs and include medical care, nutritional counseling, medications (such as antidepressants), and individual, group, and/or family psychotherapy (NIMH, 2019). For example, the Maudsley Approach has parents of adolescents with anorexia nervosa be actively involved in their child's treatment, such as assuming responsibility for feeding their child. To eliminate binge eating and purging behaviors, cognitive behavioral therapy (CBT) assists sufferers by identifying distorted thinking patterns and changing inaccurate beliefs.

Link to Learning

Visit National Eating Disorders Association to learn more about eating disorders.

Brain Development

The nervous system is composed of two basic cell types: glial cells (also known as glia) and neurons. **Glial cells** are traditionally thought to play a supportive role to neurons, both physically and metabolically. Glial cells provide scaffolding on which the nervous system is built, help neurons line up closely with each other to allow neuronal communication, provide insulation to neurons, transport nutrients and waste products, and mediate immune responses. **Neurons**, on the other hand, serve as interconnected information processors that are essential for all of the tasks of the nervous system. This section briefly describes the structure and function of neurons.

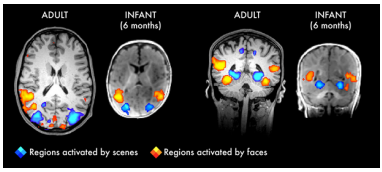

***Figure 1**. Research shows that as early at 4-6 months, infants utilize similar areas of the brain as adults to process information. Image from research article conducted by Ben Deen, Hilary Richardson, Daniel D. Dilks, Atsushi Takahashi, Boris Keil, Lawrence L. Wald, Nancy Kanwisher & Rebecca Saxe."Article | OPEN | Published: 10 January 2017 Organization of high-level visual cortex in human infants". Image retrieved from https://www.quantamagazine.org/infant-brains-reveal-how-the-mind-gets-built-20170110/.*

Communication within the central nervous system (CNS), which consists of the brain and spinal cord, begins with nerve cells called **neurons**. Neurons connect to other neurons via networks of nerve fibers called **axons** and **dendrites**. Each neuron typically has a single axon and numerous dendrites that are spread out like branches of a tree (some will say it looks like a hand with fingers). The axon of each neuron reaches toward the dendrites of other neurons at intersections called **synapses**, which are critical communication links within the brain. Axons and dendrites do not touch, instead, electrical impulses in the axons cause the release of

chemicals called **neurotransmitters** which carry information from the axon of the sending neuron to the dendrites of the receiving neuron.

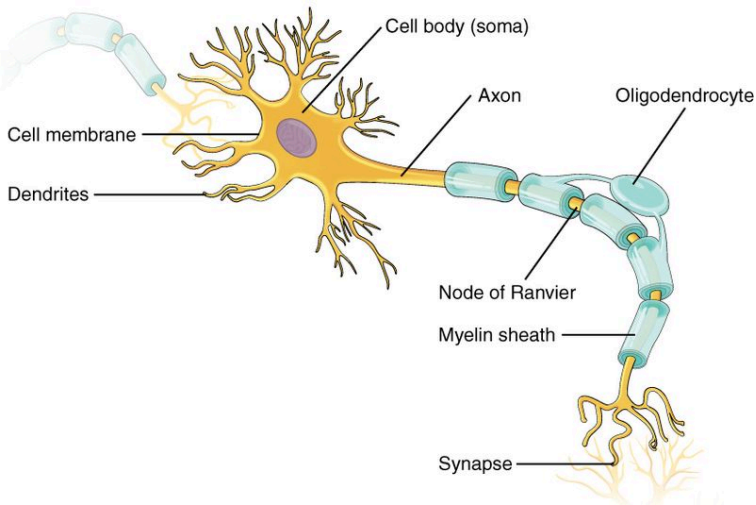

Figure 2. Neuron.

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Video 1. *The Neuron* explains the part of the neuron and the signal transmission of the neurocommunication process.

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Synaptogenesis and Synaptic Pruning

While most of the brain's 100 to 200 billion neurons are present at birth, they are not fully mature. Each neural pathway forms thousands of new connections during infancy and toddlerhood. **Synaptogenesis**, *or the formation of connections between neurons*, continues from the prenatal period forming thousands of new connections during infancy and toddlerhood. During the next several years, dendrites, or connections between neurons, will undergo a period of **transient exuberance** or temporary dramatic growth (*exuberant* because it is so rapid and *transient* because some of it is temporary). There is such a proliferation of these dendrites during these early years that by age 2 a single neuron might have thousands of dendrites.

After this dramatic increase, the neural pathways that are not used will be eliminated through a process called **synaptic pruning**, *where neural connections are reduced, thereby making those that are used much stronger*. It is thought that pruning causes the brain to function more efficiently, allowing for mastery of more complex skills (Hutchinson, 2011). Experience will shape

which of these connections are maintained and which of these are lost. Ultimately, about 40 percent of these connections will be lost (Webb, Monk, and Nelson, 2001). Transient exuberance occurs during the first few years of life, and pruning continues through childhood and into adolescence in various areas of the brain. This activity is occurring primarily in the **cortex** or the thin outer covering of the brain involved in voluntary activity and thinking.

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Video 2. *Synaptic Pruning* explains the reasons for pruning.

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Myelination

Another significant change occurring in the central nervous system

is the development of **myelin**, a coating of fatty tissues around the axon of the neuron (Carlson, 2014). myelin helps insulate the nerve cell and speed the rate of transmission of impulses from one cell to another. This increase enhances the building of neural pathways and improves coordination and control of movement and thought processes. During infancy, myelination progresses rapidly, with increasing numbers of axons acquiring myelin sheaths. This corresponds with the development of cognitive and motor skills, including language comprehension, speech acquisition, sensory processing, crawling, and walking. Myelination in the motor areas of the brain during early to middle childhood leads to vast improvements in fine and gross motor skills. Myelination continues through adolescence and early adulthood and although largely complete at this time, myelin sheaths can be added in grey matter regions such as the cerebral cortex, throughout life.

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Video 3. *Myelin* explains the formation and purpose of myelin.

Neuroplasticity

Lastly, **neuroplasticity** refers to the brain's ability to change, both physically and chemically, to enhance its adaptability to environmental change and compensate for injury. Neuroplasticity enables us to learn and remember new things and adjust to new

experiences. Both environmental experiences, such as stimulation, and events within a person's body, such as hormones and genes, affect the brain's plasticity. So too does age. Our brains are the most "plastic" when we are young children, as it is during this time that we learn the most about our environment. Adult brains demonstrate neuroplasticity, but they are influenced more slowly and less extensively than those of children (Kolb & Whishaw, 2011).

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Video 4. *Long-term Potentiation and Synaptic Plasticity* explains how learning occurs through synaptic connections and plasticity.

The control of some specific bodily functions, such as movement, vision, and hearing, is performed in specified areas of the cortex. If these areas are damaged, the individual will likely lose the ability to perform the corresponding function. For instance, if an infant suffers damage to facial recognition areas in the temporal lobe, likely, he or she will never be able to recognize faces (Farah, Rabinowitz, Quinn, & Liu, 2000). On the other hand, the brain is not divided up in an entirely rigid way. The brain's neurons have a remarkable capacity to reorganize and extend themselves to carry out particular functions in response to the needs of the organism, and to repair the damage. As a result, the brain constantly creates new neural communication routes and rewires existing ones.

The Amazing Power of Neuroplasticity

Video 5. *The Story of Jody* is a case study about a young girl that had the right hemisphere of her brain removed as a treatment for severe seizures. Due to neuroplasticity, Jody was able to recover from the damage caused by the removal of so much of her cerebrum.

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Brain Structures

At birth, the brain is about 25 percent of its adult weight, and by age two, it is at 75 percent of its adult weight. Most of the neural activity is occurring in the **cortex** or the thin outer covering of the brain involved in voluntary activity and thinking. The cortex is divided into two hemispheres, and each hemisphere is divided into four lobes, each separated by folds known as fissures. If we look at the cortex starting at the front of the brain and moving over the top, we see first the **frontal lobe** (behind the forehead), which is responsible primarily for thinking, planning, memory, and judgment. Following the frontal lobe is the **parietal lobe**, which extends from the middle

to the back of the skull and which is responsible primarily for processing information about touch. Next is the **occipital lobe**, at the very back of the skull, which processes visual information. Finally, in front of the occipital lobe, between the ears, is the **temporal lobe**, which is responsible for hearing and language.

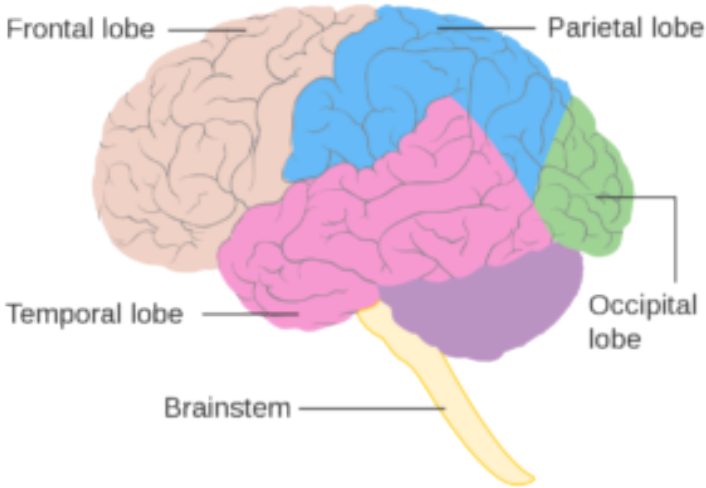

Figure 3. Lobes of the brain.

Although the brain grows rapidly during infancy, specific brain regions do not mature at the same rate. Primary motor areas develop earlier than primary sensory areas, and the prefrontal cortex, which is located behind the forehead, is the least developed. As the prefrontal cortex matures, the child is increasingly able to regulate or control emotions, plan activities, strategize, and have better judgment. This maturation is not fully accomplished in infancy and toddlerhood but continues throughout childhood, adolescence, and even into adulthood.

During adolescence, some of the most developmentally significant changes in the brain occur in the **prefrontal cortex**,

which is involved in decision making and cognitive control, as well as other higher cognitive functions. During adolescence, **myelination** and **synaptic pruning** in the prefrontal cortex increases, improving the efficiency of information processing, and neural connections between the prefrontal cortex and other regions of the brain are strengthened. However, this growth takes time, and the growth is uneven.

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Video 6. *Lobes and Landmarks of the Brain Surface* identifies the lobes and some of the major cortexes of the brain.

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The Prefrontal Cortex

The prefrontal cortex, the part of the frontal lobes lying just behind the forehead, is often referred to as the "CEO of the brain," the cognitive control center. This brain region is responsible for

cognitive analysis, abstract thought, the moderation of "correct" behavior in social situations, the capacity to exercise good judgment, self-regulation and future orientation The prefrontal cortex takes in information from all of the senses and orchestrates thoughts and actions to achieve specific goals (Casey, Jones, & Hare, 2008; Walsh, 2004). Around 11 years of age, this region of the brain begins an extended process of pruning and myelination and is not complete until near the age of 25. This is one of the last regions of the brain to reach maturation. This delay may help to explain why some adolescents act the way they do. The so-called "executive functions" of the human prefrontal cortex include:

- Focusing attention
- Organizing thoughts and problem-solving
- Foreseeing and weighing possible consequences of behavior
- Considering the future and making predictions
- Forming strategies and planning
- Ability to balance short-term rewards with long term goals
- Shifting/adjusting behavior when situations change
- Impulse control and delaying gratification
- Modulation of intense emotions
- Inhibiting inappropriate behavior and initiating appropriate behavior
- Simultaneously considering multiple streams of information when faced with complex and challenging information

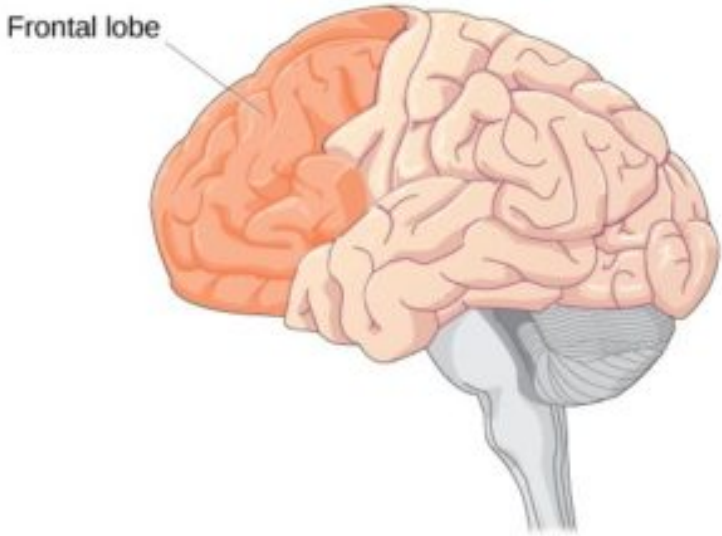

Figure 4. Brain development continues into the early 20s. The development of the frontal lobe, in particular, is important during this stage.

The difference in timing of the development of the limbic system and prefrontal cortex contributes to more risk-taking during adolescence because adolescents are motivated to seek thrills that sometimes come from risky behavior, such as reckless driving, smoking, or drinking, and have not yet developed the cognitive control to resist impulses or focus equally on the potential risks (Steinberg, 2008). One of the world's leading experts on adolescent development, Laurence Steinberg, likens this to engaging a powerful engine before the braking system is in place. The result is that adolescents are more prone to risky behaviors than are children or adults.

Lateralization

Lateralization is the process in which different functions become localized primarily on one side of the brain. For example, in most adults, the left hemisphere is more active than the right during language production, while the reverse pattern is observed during tasks involving visuospatial abilities (Springer & Deutsch, 1993). This process develops over time, however, structural asymmetries between the hemispheres have been reported even in fetuses (Chi, Dooling, & Gilles, 1997; Kasprian et al., 2011) and infants (Dubois et al., 2009).

Growth in the Hemispheres and Corpus Callosum

Between ages 3 and 6, the left hemisphere of the brain grows dramatically. This side of the brain or hemisphere is typically involved in language skills. The right hemisphere continues to grow throughout early childhood and is involved in tasks that require spatial skills, such as recognizing shapes and patterns. The Corpus Callosum, a dense band of fibers that connects the two hemispheres of the brain, contains approximately 200 million nerve fibers that connect the hemispheres (Kolb & Whishaw, 2011).

The corpus callosum is located a couple of inches below the longitudinal fissure, which runs the length of the brain and separates the two cerebral hemispheres (Garrett, 2015). Because the two hemispheres carry out different functions, they communicate with each other and integrate their activities through the corpus callosum. Additionally, because incoming information is directed toward one hemisphere, such as visual information from the left eye being directed to the right hemisphere, the corpus callosum shares this information with the other hemisphere.

The corpus callosum undergoes a growth spurt between ages 3 and 6, and this results in improved coordination between right and left hemisphere tasks. For example, in comparison to other individuals, children younger than 6 demonstrate difficulty coordinating an Etch A Sketch toy because their corpus callosum is not developed enough to integrate the movements of both hands (Kalat, 2016).

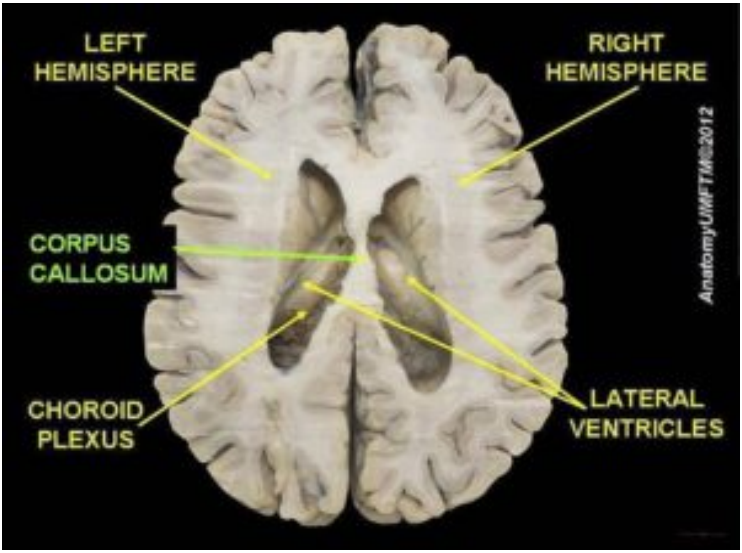

Figure 5. Corpus callosum.

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The Limbic System

The **limbic system** develops years ahead of the prefrontal cortex. Development in the limbic system plays an important role in determining rewards and punishments and processing emotional experience and social information. Pubertal hormones target the **amygdala** directly, and powerful sensations become compelling (Romeo, 2013). Brain scans confirm that cognitive control, revealed by fMRI studies, is not fully developed until adulthood because the prefrontal cortex is limited in connections and engagement (Hartley & Somerville, 2015). Recall that this area is responsible for judgment, impulse control, and planning, and it is still maturing into early adulthood (Casey, Tottenham, Liston, & Durston, 2005).

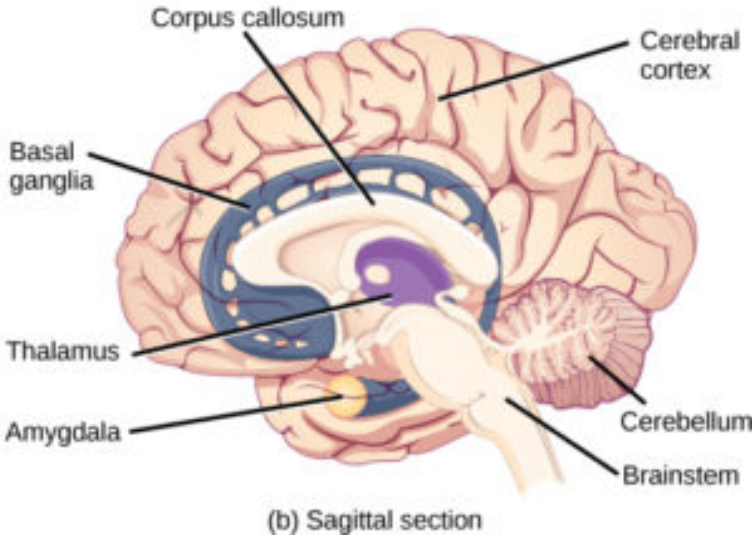

Figure 6. The limbic system.

Additionally, changes in both the levels of the neurotransmitters **dopamine** and **serotonin** in the limbic system make adolescents more emotional and more responsive to rewards

and stress. Dopamine is a neurotransmitter in the brain associated with pleasure and attuning to the environment during decision-making. During adolescence, dopamine levels in the limbic system increase, and the input of dopamine to the prefrontal cortex increases. The increased dopamine activity in adolescence may have implications for adolescent risk-taking and vulnerability to boredom. Serotonin is involved in the regulation of mood and behavior. It affects the brain in a different way. Known as the "calming chemical," serotonin eases tension and stress. Serotonin also puts a brake on the excitement and sometimes recklessness that dopamine can produce. If there is a defect in the serotonin processing in the brain, impulsive or violent behavior can result.

Brain Region Integration

MRI studies of the brain show that developmental processes tend to occur in the brain in a back-to-front pattern, explaining why the prefrontal cortex develops last. These studies have also found that teens have less white matter (myelin) in the frontal lobes of their brains when compared to adults, but this amount increases as the teen ages. With more myelin comes the growth of important brain connections, allowing for a better flow of information between brain regions. MRI research has also revealed that during adolescence, white matter increases in the corpus callosum, the bundle of nerve fibers connecting the right and left hemispheres of the brain. This allows for enhanced communication between the hemispheres and enables a full array of analytic and creative strategies to be brought to bear in responding to the complex dilemmas that may arise in a young person's life (Giedd, 2004).

In sum, the adolescent years are a time of intense brain changes. Interestingly, two of the primary brain functions develop at different rates. Brain research indicates that the part of the brain that perceives rewards from risk, the limbic system, kicks into high

gear in early adolescence. The part of the brain that controls impulses and engages in longer-term perspective, the frontal lobes, mature later. This may explain why teens in mid-adolescence take more risks than older teens. As the frontal lobes become more developed, two things happen. First, self-control develops as teens are better able to assess cause and effect. Second, more areas of the brain become involved in processing emotions, and teens become better at accurately interpreting others' emotions.

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Video 7. *Brain Changes during Adolescence* describes some of the physical changes that occur during adolescence.

The Teen Brain: 6 Things to Know from the National Institute of Mental Health

Your brain does not keep getting bigger as you get older

For girls, the brain reaches its largest physical size around 11 years old and for boys, the brain reaches its largest physical size around age 14. Of course, this difference in age does not mean either boys or girls are smarter than one another!

But that doesn't mean your brain is done maturing

For both boys and girls, although your brain may be as large as it will ever be, your brain doesn't finish developing and maturing until your mid- to late-20s. The front part of the brain, called the prefrontal cortex, is one of the last brain regions to mature. It is the area responsible for planning, prioritizing, and controlling impulses.

The teen brain is ready to learn and adapt

In a digital world that is constantly changing, the adolescent brain is well prepared to adapt to new technology—and is shaped in return by experience.

Many mental disorders appear during adolescence

All the big changes the brain is experiencing may explain why adolescence is the time when many mental disorders—such as schizophrenia, anxiety, depression, bipolar disorder, and eating disorders—emerge.

The teen brain is resilient

Although adolescence is a vulnerable time for the brain and for teenagers in general, most teens go on to become

healthy adults. Some changes in the brain during this important phase of development actually may help protect against long-term mental disorders.

Teens need more sleep than children and adults

Although it may seem like teens are lazy, science shows that melatonin levels (or the "sleep hormone" levels) in the blood naturally rise later at night and fall later in the morning than in most children and adults. This may explain why many teens stay up late and struggle with getting up in the morning. Teens should get about 9-10 hours of sleep a night, but most teens don't get enough sleep. A lack of sleep makes paying attention hard, increases impulsivity, and may also increase irritability and depression.

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Sensory and Motor Development

Sensory Development

As infants and children grow, their senses play a vital role in encouraging and stimulating the mind and in helping them observe their surroundings. Two terms are important to understand when learning about the senses. The first is **sensation**, or the interaction of information with the sensory receptors. The second is **perception**, or the process of interpreting what is sensed. It is possible for someone to sense something without perceiving it. Gradually, infants become more adept at perceiving with their senses, making them more aware of their environment and presenting more affordances or opportunities to interact with objects.

Vision

What can young infants see, hear, and smell? Newborn infants' sensory abilities are significant, but their senses are not yet fully developed. Many of a newborn's innate preferences facilitate interaction with caregivers and other humans. The womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth. Newborns typically cannot see further than 8 to 16 inches away from their faces, have difficulty keeping a moving object within their gaze, and can detect contrast more than color differences. If you have ever seen a newborn struggle to see, you can appreciate the cognitive efforts being made

to take in visual stimulation and build those neural pathways between the eye and the brain.

Although vision is their least developed sense, newborns already show a preference for faces. When you glance at a person, where do you look? Chances are you look into their eyes. If so, why? It is probably because there is more information there than in other parts of the face. Newborns do not scan objects this way; rather, they tend to look at the chin or another less detailed part of the face. However, by 2 or 3 months, they will seek more detail when visually exploring an object and begin showing preferences for unusual images over familiar ones, for patterns over solids, faces over patterns, and three-dimensional objects over flat images. Newborns have difficulty distinguishing between colors, but within a few months are able to discrimination between colors as well as adults. Infants can also sense depth as binocular vision develops at about 2 months of age. By 6 months, the infant can perceive depth perception in pictures as well (Sen, Yonas, & Knill, 2001). Infants who have experience crawling and exploring will pay greater attention to visual cues of depth and modify their actions accordingly (Berk, 2007).

Visual Pathways

Have you ever examined the drawings of young children? If you look closely, you can almost see the development of visual pathways reflected in the way these images change as pathways become more mature. Early scribbles and dots illustrate the use of simple motor skills. No real connection is made between an image being visualized and what is created on paper.

At age 3, the child begins to draw wispy creatures with heads and not much other detail. Gradually pictures begin to have more detail and incorporate more parts of the body. Arm buds become arms and faces take on noses, lips, and eventually eyelashes. Look for

drawings that you or your child has created to see this fascinating trend. Here are some examples of pictures drawn by girls from ages 2 to 7 years.

Figure 1. *These drawings demonstrate the progression in both drawing skill and visual processing during early childhood. The top left drawing is done by a 2-year old, and the bottom right image is drawn by a 7-year old.*

Hearing

The infant's sense of hearing is very keen at birth. If you remember from an earlier module, this ability to hear is evidenced as soon as the 5th month of prenatal development. In fact, an infant can

distinguish between very similar sounds as early as one month after birth and can distinguish between a familiar and non-familiar voice even earlier. Babies who are just a few days old prefer human voices, they will listen to voices longer than sounds that do not involve speech (Vouloumanos & Werker, 2004), and they seem to prefer their mother's voice over a stranger's voice (Mills & Melhuish, 1974). In an interesting experiment, 3-week-old babies were given pacifiers that played a recording of the infant's mother's voice and of a stranger's voice. When the infants heard their mother's voice, they sucked more strongly at the pacifier (Mills & Melhuish, 1974). Some of this ability will be lost by 7 or 8 months as a child becomes familiar with the sounds of a particular language and less sensitive to sounds that are part of an unfamiliar language.

Pain and Touch

Immediately after birth, a newborn is sensitive to touch and temperature, and is also sensitive to pain, responding with crying and cardiovascular responses. Newborns who are **circumcised** (the surgical removal of the foreskin of the penis) without anesthesia experience pain, as demonstrated by increased blood pressure, increased heart rate, decreased oxygen in the blood, and a surge of stress hormones (United States National Library of Medicine, 2016). According to the American Academy of Pediatrics (AAP), there are medical benefits and risks to circumcision. They do not recommend routine circumcision, however, they stated that because of the possible benefits (including prevention from urinary tract infections, penile cancer, and some STDs) parents should have the option to circumcise their sons if they want to (AAP, 2012).

The sense of touch is acute in infants and is essential to a baby's growth of physical abilities, language and cognitive skills, and socio-emotional competency. Touch not only impacts short-term development during infancy and early childhood but also has long-

term effects, suggesting the power of positive gentle touch from birth. Through touch, infants learn about their world, bond with their caregiver, and communicate their needs and wants. Research emphasizes the great benefits of touch for premature babies, but the presence of such contact has been shown to benefit all children (Stack, 2010). In an extreme example, some children in Romania were reared in orphanages in which a single care worker may have had as many as 10 infants to care for at one time. These infants were not often helped or given toys with which to play. As a result, many of them were developmentally delayed (Nelson, Fox, & Zeanah, 2014). When we discuss emotional and social development later in this module, you will also see the important role that touch plays in helping infants feel safe and protected, which builds trust and secure attachments between the child and their caregiver.

Taste and Smell

Not only are infants sensitive to touch, but newborns can also distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. They can distinguish between their mother's scent and that of others, and prefer the smell of their mothers. A newborn placed on the mother's chest will inch up to the mother's breast, as it is a potent source of the maternal odor. Even on the first day of life, infants orient to their mother's odor and are soothed, when crying, by their mother's odor (Sullivan et al., 2011).

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Motor Development

From Reflexes to Voluntary Movements

Every basic **motor skill** (any movement ability) develops over the first two years of life. The sequence of motor skills first begins with **reflexes**. Infants are equipped with a number of reflexes, or involuntary movements in response to stimulation, and some are necessary for survival. These include the breathing reflex, or the need to maintain an oxygen supply (this includes hiccups, sneezing, and thrashing reflexes), reflexes that maintain body temperature (crying, shivering, tucking the legs close, and pushing away blankets), the sucking reflex, or automatically sucking on objects that touch their lips, and the rooting reflex, which involves turning toward any object that touches the cheek (which manages feeding, including the search for a nipple). Other reflexes are not necessary for survival, but signify the state of brain and body functions. Some of these include: the babinski reflex (toes fan upward when feet are stroked), the stepping reflex (babies move their legs as if to walk when feet touch a flat surface), the palmar grasp (the infant will tightly grasp any object placed in its palm), and the moro reflex (babies will fling arms out and then bring to chest if they hear a loud noise). These movements occur automatically and are signals that the infant is functioning well neurologically. Within the first several

weeks of life, these reflexes are replaced with voluntary movements or motor skills.

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Video 1. *Neonatal Reflexes* reviews many of the primitive and survival reflexes present at birth.

Watch It

Video 2. Watch this video to see examples of newborn reflexes.

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Major Motor Milestones

Motor development occurs in an orderly sequence as infants move from reflexive reactions (e.g., sucking and rooting) to more advanced motor functioning. This development proceeds in a **cephalocaudal** (from head-down) and **proximodistal** (from center-out) direction. For instance, babies first learn to hold their heads up, then sit with assistance, then sit unassisted, followed later by crawling, pulling up, cruising, and then walking. As motor skills develop, there are certain developmental milestones that young children should achieve. For each milestone, there is an average age, as well as a range of ages in which the milestone should be reached. An example of a developmental milestone is a baby holding up its head. Babies on average are able to hold up their heads at 6 weeks old, and 90% of babies achieve this between 3 weeks and 4 months old. If a baby is not holding up his head by 4 months old, he is showing a delay. On average, most babies sit alone at 7 months old. Sitting involves both coordination and muscle strength, and 90% of babies achieve this milestone between 5 and 9 months old (CDC, 2018). If the child is displaying delays on several milestones, that is a reason for concern, and the parent or caregiver should discuss this with the child's pediatrician. Some developmental delays can be identified and addressed through early intervention.

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Video 3. *Major Motor Milestones* identifies some of the major motor developments in the first few years of life.

Link to Learning

For more information on developmental milestones, please see the CDC's Developmental Milestones.

Gross Motor Skills

Figure 2. *This baby is working on his pincer grasp.*

Gross motor skills are voluntary movements that involve the use of large muscle groups and are typically large movements of the arms, legs, head, and torso. These skills begin to develop first. Examples include moving to bring the chin up when lying on the stomach, moving the chest up, rocking back and forth on hands and knees. But it also includes exploring an object with one's feet as many babies do, as early as 8 weeks of age, if seated in a carrier or other device that frees the hips. This may be easier than reaching for an object with the hands, which requires much more practice (Berk, 2007). And sometimes an infant will try to move toward an object while crawling and surprisingly move backward because of the greater amount of strength in the arms than in the legs!

Fine Motor Skills

Fine motor skills are more exact movements of the hands and fingers and include the ability to reach and grasp an object. These skills focus on the muscles in the fingers, toes, and eyes, and enable coordination of small actions (e.g., grasping a toy, writing with a pencil, and using a spoon). Newborns cannot grasp objects voluntarily but do wave their arms toward objects of interest. At about 4 months of age, the infant is able to reach for an object, first with both arms and within a few weeks, with only one arm. Grasping an object involves the use of the fingers and palm, but no thumbs. Stop reading for a moment and try to grasp an object using the fingers and the palm. How does that feel? How much control do you have over the object? If it is a pen or pencil, are you able to write with it? Can you draw a picture? The answer is, probably not. Use of the thumb comes at about 9 months of age when the infant is able to grasp an object using the forefinger and thumb (**the pincer grasp**). This ability greatly enhances the ability to control and manipulate an object, and infants take great delight in this newfound ability. They may spend hours picking up small objects from the floor and placing them in containers. By 9 months, an infant can also watch a moving object, reach for it as it approaches, and grab it. This is quite a complicated set of actions if we remember how difficult this would have been just a few months earlier.

Table 1. Timeline of Developmental Milestones.

~2 months	• Can hold head upright on own • Smiles at sound of familiar voices and follows movement with eyes
~3 months	• Can raise head and chest from prone position • Smiles at others • Grasps objects • Rolls from side to back
~4-5 months	• Babbles, laughs, and tries to imitate sounds • Begins to roll from back to side
~6 months	• Moves objects from hand to hand

~7-8 months	• Can sit without support • May begin to crawl • Responds to own name • Finds partially hidden objects
~8-9 months	• Walks while holding on • Babbles “mama” and “dada” • Claps
~11-12 months	• Stands alone • Begins to walk • Says at least one word • Can stack two blocks
~18 months	• Walks independently • Drinks from a cup • Says at least 15 words • Points to body parts
~2 years	• Runs and jumps • Uses two-word sentences • Follows simple instructions • Begins make-believe play
~3 years	• Speaks in multi-word sentences • Sorts objects by shape and color

~4 years	• Draws circles and squares • Rides a tricycle • Gets along with people outside of the family • Gets dressed
~5 years	• Can jump, hop, and skip • Knows name and address • Counts ten or more objects

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Motor Skill Development

Remember that **gross motor skills** are voluntary movements involving the use of large muscle groups while **fine motor skills** are more exact movements of the hands and fingers and include the ability to reach and grasp an object. Early childhood is a time of development of both gross and fine motor skills.

Early childhood is a time when children are especially attracted to motion and song. Days are filled with moving, jumping, running, swinging and clapping, and every place becomes a playground. Even the booth at a restaurant affords the opportunity to slide around in the seat or disappear underneath and imagine being a sea creature in a cave! Of course, this can be frustrating to a caregiver, but it's the business of early childhood. Children may frequently ask their caregivers to "look at me" while they hop or roll down a hill. Children's songs are often accompanied by arm and leg movements or cues to turn around or move from left to right. Running, jumping, dancing movements, etc. all afford children the ability to improve their gross motor skills.

Fine motor skills are also being refined in activities such as pouring water into a container, drawing, coloring, and using scissors. Some children's songs promote fine motor skills as well (have you ever heard of the song "itsy, bitsy, spider"?). Mastering the fine art of cutting one's own fingernails or tying their shoes will take a lot of practice and maturation. Fine motor skills continue to develop in middle childhood, but for preschoolers, the type of play that deliberately involves these skills is emphasized.

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Video 4. *Early Childhood Gross Motor Development* identifies some of the major gross motor developments in early childhood.

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Link to Learning

The Centers for Disease Control and Prevention (CDC) describes the developmental milestones for children from 2 months through 5 years old. After reviewing the information, take the CDC's Developmental Milestones quiz to see how well you recall what you've learned. If you are a parent with concerns about your child's development, contact your pediatrician.

Sleep

Sleep is a period of rest that alternates with wakefulness. You have internal body clocks that control when you are awake and when your body is ready for sleep. These clocks have cycles of approximately 24 hours. The clocks are regulated by multiple factors, including light, darkness, and sleep schedules. Once asleep, you cycle through the stages of sleep throughout the night in a predictable pattern. These sleep patterns change with age.

Along with food and water, sleep is one of the human body's most important physiological needs—we cannot live without it. Extended sleeplessness (i.e., lack of sleep for longer than a few days) has severe psychological and physical effects. Research on rats has found that a week of no sleep leads to loss of immune function, and two weeks of no sleep leads to death. Recently, neuroscientists have learned that at least one vital function of sleep is related to learning and memory. New findings suggest that sleep plays a critical role in flagging and storing important memories, both intellectual and physical, and perhaps in making subtle connections that were invisible during waking hours.

Many factors play a role in preparing your body to fall asleep and wake up. Your body has several internal clocks, called circadian clocks. These typically follow a 24-hour repeating rhythm, called the circadian rhythm. This rhythm affects every cell, tissue, and organ in your body and how they work. Your central circadian clock, located in your brain, tells you when it is time for sleep. Other circadian clocks are located in organs throughout your body. Your body's internal clocks are in sync with certain cues in the environment. Light, darkness, and other cues help determine when you feel awake and when you feel drowsy. Artificial light and caffeine can disrupt this process by giving your body false wakefulness cues.

Your body has a biological need for sleep that increases when you have been awake for a long time. This is controlled by homeostasis,

the process by which your body keeps your systems, such as your internal body temperature, steady. A compound called adenosine is linked to this need for sleep. While you are awake, the level of adenosine in your brain continues to rise. The rising levels signal a shift toward sleep. Caffeine and certain drugs can interrupt this process by blocking adenosine.

If you follow a natural schedule of days and nights, light signals received through your eyes tell your brain that it is daytime. The area of your brain that receives these signals, called the suprachiasmatic nucleus, transmits the signals to the rest of your body through the sympathetic system and the parasympathetic system. This helps your central body clock stay in tune with the day and night. Exposure to bright artificial light in the late evening can disrupt this process and prevent your brain from releasing melatonin. This can make it harder to fall asleep. Examples of bright artificial light include the light from a TV screen, a smartphone, or a very bright alarm clock.

The light–dark cycle influences when your brain makes and releases a hormone called melatonin. Melatonin travels to the cells in your body through your bloodstream. The amount of melatonin in your bloodstream starts to increase in the evening and peaks in the early morning. Melatonin is thought to promote sleep. As you are exposed to more light, such as the sun rising, your body releases another hormone called cortisol. Cortisol naturally prepares your body to wake up.

When you sleep, you cycle through two phases of sleep: rapid eye movement (REM) and non-REM sleep. The cycle starts over every 80 to 100 minutes. Usually, there are four to six cycles per night. You may wake up briefly between cycles. Sleep studies use sensors to record eye movements and brain activity, which are used to classify sleep phases and stages.

During REM sleep, your eyes twitch and your brain is active. Brain activity measured during REM sleep is similar to your brain's activity during waking hours. Dreaming usually happens during REM sleep. Your muscles normally become limp to prevent you from acting out

your dreams. You usually have more REM sleep later in the night, but you do not have as much REM sleep in colder temperatures. This is because, during REM sleep, your body does not regulate its temperature properly.

The patterns and types of sleep change as people mature. For example, newborns spend more time in REM sleep. The amount of slow-wave sleep peaks in early childhood and then drops sharply in the teenage years. Slow-wave sleep continues to decrease through adulthood, and older people may not have any slow-wave sleep at all.

The amount of sleep an individual needs varies depending on multiple factors including age, physical condition, psychological condition, and energy exertion. Just like any other human characteristic, the amount of sleep people need to function best differs among individuals, even those of the same age and gender.

Though there is no magic sleep number, there are general rules for how much sleep certain age groups need. For instance, children need more sleep per day in order to develop and function properly: up to 18 hours for newborn babies, with a declining rate as a child ages. A newborn baby spends almost 9 hours a day in REM sleep. By the age of five, only slightly over two hours is spent in REM. Studies show that young children need about 10 to 11 hours of sleep, adolescents need between 8.5 and 9.25, and adults generally need between 7 and 9 hours.

Table 1. Typical amount of sleep by age

How much sleep is enough?

Age	Recommended Amount of Sleep
Infants (4-12 Months)	12-16 Hours/Day (including naps)
Children (1-2 Years)	11-14 Hours/Day (including naps)
Children (3-5 Years)	10-13 Hours/Day (including naps)
Children (6-12 Years)	9-12 Hours/Day
Teens (13-18 Years)	8-10 Hours/Day
Adults (18+ Years)	7-8 Hours/Day

NIH National Heart, Lung, and Blood Institute

nhlbi.nih.gov

Infant Sleep

Infants 0 to 2 years of age sleep an average of 12.8 hours a day, although this changes and develops gradually throughout an infant's life. For the first three months, newborns sleep between 14 and 17 hours a day, then they become increasingly alert for longer periods of time. About one-half of an infant's sleep is rapid eye movement (REM) sleep, and infants often begin their sleep cycle with REM rather than non-REM sleep. They also move through the sleep cycle more quickly than adults. Parents spend a significant amount of time worrying about and losing even more sleep over their infant's sleep schedule when there remains a great deal of variation in sleep patterns and habits for individual children. A 2018 study showed that at 6 months of age, 62% of infants slept at least six hours during the night, 43% of infants slept at least 8 hours through the

night, and 38% of infants were *not* sleeping at least six continual hours through the night. At 12 months, 28% of children were still not sleeping at least 6 uninterrupted hours through the night, while 78% were sleeping at least 6 hours, and 56% were sleeping at least 8 hours.

The most common infant sleep-related problem reported by parents is nighttime waking. Studies of new parents and sleep patterns show that parents lose the most sleep during the first three months with a new baby, with mothers losing about an hour of sleep each night, and fathers losing a disproportionate 13 minutes. This decline in sleep quality and quantity for adults persists until the child is about six years old.

While this shows there is no precise science as to when and how an infant will sleep, there are general trends in sleep patterns. Around six months, babies typically sleep between 14-15 hours a day, with 3-4 of those hours happening during daytime naps. As they get older, these naps decrease from several to typically two naps a day between ages 9-18 months. Often, periods of rapid weight gain or changes in developmental abilities such as crawling or walking will cause changes to sleep habits as well. Infants generally move towards one 2-4 hour nap a day by around 18 months, and many children will continue to nap until around four or five years old.

Sudden Unexpected Infant Deaths (SUID)

Each year in the United States, there are about 3,500 Sudden Unexpected Infant Deaths (SUID). These deaths occur among infants less than one-year-old and have no immediately obvious cause (CDC, 2015). The three commonly reported types of SUID are:

- **Sudden Infant Death Syndrome (SIDS):** SIDS is identified when the death of a healthy infant occurs suddenly and unexpectedly, and medical and forensic investigation findings

(including an autopsy) are inconclusive. SIDS is the leading cause of death in infants up to 12 months old, and approximately 1,500 infants died of SIDS in 2013 (CDC, 2015). The risk of SIDS is highest at 4 to 6 weeks of age. Because SIDS is diagnosed when no other cause of death can be determined, possible causes of SIDS are regularly researched. One leading hypothesis suggests that infants who die from SIDS have abnormalities in the area of the brainstem responsible for regulating breathing (Weekes-Shackelford & Shackelford, 2005). Although the exact cause is unknown, doctors have identified the following risk factors for SIDS:

  - low birth weight
  - siblings who have had SIDS
  - sleep apnea
  - of African-American or Eskimo decent
  - low socioeconomic status (SES)
  - smoking in the home
- **Unknown Cause:** The sudden death of an infant less than one year of age that cannot be explained because a thorough investigation was not conducted and the cause of death could not be determined.
- **Accidental Suffocation and Strangulation in Bed:** Reasons for accidental suffocation include the following: Suffocation by soft bedding, another person rolling on top of or against the infant while sleeping, an infant being wedged between two objects such as a mattress and wall, and strangulation such as when an infant's head and neck become caught between crib railings.

The combined SUID rate declined considerably following the release of the American Academy of Pediatrics safe sleep recommendations in 1992, which advocated that infants be placed on their backs for sleep (non-prone position). These recommendations were followed by a major Back to Sleep Campaign in 1994. According to the CDC, the SIDS death rate is now less than one-fourth of what is was

(130 per 100,000 live birth in 1990 versus 40 in 2015). However, accidental suffocation and strangulation in bed mortality rates remained unchanged until the late 1990s. Some parents were still putting newborns to sleep on their stomachs partly because of past tradition. Most SIDS victims experience several risks, an interaction of biological and social circumstances. But thanks to research, the major risk, stomach sleeping, has been highly publicized. Other causes of death during infancy include congenital birth defects and homicide.

Co-Sleeping

The location of sleep depends primarily on the baby's age and culture. **Bed-sharing** (in the parents' bed) or **co-sleeping** (in the parents' room) is the norm is some cultures, but not in others (Esposito et al. 2015). Colvin, Collie-Akers, Schunn, and Moon (2014) analyzed a total of 8,207 deaths from 24 states during 2004–2012. The deaths were documented in the National Center for the Review and Prevention of Child Deaths Case Reporting System, a database of death reports from state child death review teams. The results indicated that younger victims (0-3 months) were more likely to die by bed-sharing and sleeping in an adult's bed or on a person. A higher percentage of older victims (4 months to 364 days) rolled into objects in the sleep environment and changed position from side/back to prone. Carpenter et al. (2013) compared infants who died of SIDS with a matched control and found that infants younger than three months old who slept in bed with a parent were five times more likely to die of SIDS compared to babies who slept separately from the parents, but were still in the same room. They concluded that bed-sharing, even when the parents do not smoke or take alcohol or drugs, increases the risk of SIDS. However, when combined with parental smoking and maternal alcohol consumption

and/or drug use, the risks associated with bed-sharing greatly increased.

Despite the risks noted above, the controversy about where babies should sleep has been ongoing. Co-sleeping has been recommended for those who advocate attachment parenting (Sears & Sears, 2001), and other research suggests that bed-sharing and co-sleeping is becoming more popular in the United States (Colson et al., 2013). So, what are the latest recommendations?

The American Academy of Pediatrics (AAP) actually updated their recommendations for a Safe Infant Sleeping Environment in 2016. The most recent AAP recommendations on creating a safe sleep environment include:

- Back to sleep for every sleep. Always place the baby on his or her back on a firm sleep surface such as a crib or bassinet with a tight-fitting sheet.
- Avoid the use of soft bedding, including crib bumpers, blankets, pillows, and soft toys. The crib should be bare.
- Breastfeeding is recommended.
- Share a bedroom with parents, but not the same sleeping surface, preferably until the baby turns 1 but at least for the first six months. Room-sharing decreases the risk of SIDS by as much as 50 percent.
- Avoid baby's exposure to smoke, alcohol, and illicit drugs.

As you can see, there is a recommendation to now "share a bedroom with parents," but not the same sleeping surface. Breastfeeding is also recommended as adding protection against SIDS, but after feeding, the AAP encourages parents to move the baby to his or her separate sleeping space, preferably a crib or bassinet in the parents' bedroom. Finally, the report included new evidence that supports skin-to-skin care for newborn infants.

Link to Learning

The website **Zero to Three** has more information on infant sleep patterns and habits. Feel free to explore their multiple topics on the subject.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=84#oembed-1

Sleep in Childhood

The American Academy of Sleep Medicine (2021) has recommended that toddlers get 11 to 14 hours of sleep in a 24 hour period. This may include naps throughout the day. Preschool children will naturally need fewer naps and will typically forgo naps by elementary school. This age group should sleep 10 to 13 hours per day. Children aged 6–12 years should regularly sleep 9 to 12 hours per 24 hours.

Children who do not get enough sleep have a higher risk of obesity, diabetes, injuries, poor mental health, and problems with attention and behavior. Children who get the recommended hours of sleep on a regular basis tend to experience improved attention, behavior, learning, memory, emotional regulation, quality of life, and

mental and physical health (American Academy of Sleep Medicine, 2021).

Bedtime Calculator

The American Academy of Sleep Medicine provides a bedtime calculator to help parents determine bedtimes for their children based on age and waketime.

Sleep Hygiene

Good sleep habits (sometimes referred to as "sleep hygiene") can help you get a good night's sleep. This means having both a bedroom environment and daily routines that promote consistent, uninterrupted sleep.

Some habits that can improve sleep health:

- Be consistent. Go to bed at the same time each night and get up at the same time each morning, including on the weekends.
- Bedtime routines can signal to the body and brain that it is time to sleep. For children, this might include a bath, story, or songs before going to bed. Additionally, limit children's time spent awake in bed doing non-sleep activities to avoid associating bed with play.
- Make sure the bedroom is quiet, dark, relaxing, and at a comfortable temperature, and avoid allowing children to fall asleep somewhere other than their bed.
- Remove electronic devices, such as TVs, computers, and smartphones, from the bedroom and avoid artificial light for an hour before bed.

- Avoid large meals, liquids two hours before, and caffeine eight hours before bedtime.
- Get some exercise. Being physically active during the day can help you fall asleep more easily at night.

Sleep Disturbances

Sometimes children have difficulty falling or staying asleep. Changes in routine, excitement, biological changes, health issues, or sleep disorders can be the culprit.

Here are a few suggestions to help children that are having sleep difficulties:

- Use relaxation techniques, such as deep breathing or imagining positive scenes, to help your child relax before bed.
- For children who worry a lot at bedtime, try scheduling a "worry time" earlier in the day and encourage them to talk about their worries with a parent.
- Security objects, such as a blanket or stuffed toy, can help children feel safe and secure at bedtime.
- If your child wakes up and has trouble falling back asleep, it is better for them to get out of bed. Do a quiet activity, such as reading, for 20-30 minutes. Then have them return to bed.

Sleepwalking (Somnambulism)

Sleepwalking (sometimes called sleepwalking disorder, **somnambulism**, or noctambulation) causes a person to get up and walk during the early hours of sleep. The person may sit up and look awake (though they're actually asleep), get up and walk around, move items, or dress or undress themselves. They will have a blank stare and still be able to perform complex tasks.

Some individuals also talk while in their sleep, saying meaningless words and even having arguments with people who are not there. A person who sleepwalks will be confused upon waking up and may also experience anxiety and fatigue. Sleepwalking can be dangerous—people have been known to seriously hurt themselves during sleepwalking episodes. It is most common in children, but it also occurs occasionally in adults.

Sleepwalkers can be difficult to awaken. They may be startled by waking them and usually have no memory of the sleepwalking event. Often, the best way to manage a sleepwalking episode is to get them back to bed by gently guiding them back to their room and into bed If they resist, stay with them and help them avoid dangerous objects and situations. If you must awaken them, do so with loud noises rather than by shaking or touching them roughly. The best prevention of sleepwalking is good sleep hygiene.

Sleep Terrors and Nightmare Disorder

Sleep terrors are characterized by a sudden arousal from deep sleep with a scream or cry, accompanied by some behavioral manifestations of intense fear. Sleep terrors typically occur in the first few hours of sleep, during stage 3 NREM sleep. Night terrors tend to happen during periods of arousal from delta sleep (i.e., slow-wave sleep). They are worse than nightmares, causing significant disorientation, panic, and anxiety. They can last up to 10 minutes, and the person may be screaming and difficult to wake. Sleep terrors are most common in young children but may continue into adulthood.

Like sleepwalking, waking someone that is having night terrors can be difficult and the person will likely be disorientated and confused. The best way to handle a night terror is to wait it out patiently and make sure the person doesn't get hurt if thrashing around. Kids usually will settle down and return to sleep on their own in a few minutes.

Sleep in Adolescence

Adolescents' normal sleep patterns are different from those of children and adults. Teens are often drowsy upon waking, tired during the day, and wakeful at night. Although it may seem like teens are lazy, science shows that **melatonin** levels (or the "sleep hormone" levels) in the blood naturally rise later at night and fall later in the morning in teens than in most children and adults. This may explain why many teens stay up late and struggle with getting up in the morning.

According to the National Sleep Foundation (NSF) (2016), adolescents need about 8 to 10 hours of sleep each night to function best. The most recent Sleep in America poll in 2006 indicated that adolescents between sixth and twelfth grade were not getting the recommended amount of sleep. On average, adolescents only received 7 ½ hours of sleep per night on school nights with younger adolescents getting more than older ones (8.4 hours for sixth graders and only 6.9 hours for those in twelfth grade). For older adolescents, only about one in ten (9%) get an optimal amount of sleep, and they are more likely to experience negative consequences the following day. These include feeling too tired or sleepy, being cranky or irritable, falling asleep in school, having a depressed mood, and drinking caffeinated beverages (NSF, 2016). Additionally, they are at risk for substance abuse, car crashes, poor academic performance, obesity, and a weakened immune system (Weintraub, 2016).

Why don't adolescents get adequate sleep? In addition to known environmental and social factors, including work, homework, media, technology, and socializing, the adolescent brain is also a factor. As adolescents go through puberty, their circadian rhythms change and push back their sleep time until later in the evening (Weintraub, 2016). This biological change not only keeps adolescents awake at night, but it also makes it difficult for them to get up in the morning. When they are awake too early, their brains do not function

optimally. Impairments are noted in attention, behavior, and academic achievement, while increases in tardiness and absenteeism are also demonstrated.

To support adolescents' later sleeping schedule, the Centers for Disease Control and Prevention recommended that school not begin any earlier than 8:30 a.m. Unfortunately, over 80% of American schools begin their day earlier than 8:30 a.m. with an average start time of 8:03 a.m. (Weintraub, 2016). Psychologists and other professionals have been advocating for later school times, and they have produced research demonstrating better student outcomes for later start times. More middle and high schools have changed their start times to reflect the sleep research better. However, the logistics of changing start times and bus schedules are proving too difficult for some schools leaving many adolescents vulnerable to the negative consequences of sleep deprivation.

Links to Learning

Video 1. *Why Schools Should Start Later for Teens* discusses how early school start times impact teens and how later start times can benefit students. As research reveals the importance of sleep for teenagers, many people advocate for later high school start times. Read about some of the **research at the National Sleep Foundation on school start times**.

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Glossary

adolescent growth spurt: rapid increase in the individual's height and weight during puberty resulting from simultaneous release of growth hormones, thyroid hormones, and androgens. Males experience their growth spurt about two years later, on average, than females

adrenarche: an increase in the production of androgens by the adrenal cortex that usually occurs during the eighth or ninth year of life and typically peaks at around 10 to 14 years of age and is eventually involved in the development of pubic hair, body odor, skin oiliness, and acne

amygdala: part of the limbic system in the brain, which is involved with emotions and emotional responses and is particularly active during puberty

anorexia nervosa: an eating disorder characterized by self-starvation. Affected individuals voluntarily under-eat and often over-exercise, depriving their vital organs of nutrition. Anorexia can be fatal

axons: fibers that extend from the neurons and transmit electrochemical impulses from that neuron to the dendrites of other neurons

bed-sharing: when two or more people sleep in the same bed

binge-eating disorder: an eating disorder characterized by recurrent episodes of eating large quantities of food (often very quickly and to the point of discomfort); a feeling of a loss of control during the binge; experiencing shame, distress, or guilt afterwards; and not regularly using unhealthy compensatory measures (e.g., purging) to counter the binge eating. It is the most common eating disorder in the United States

body dissatisfaction: negative subjective evaluation of the weight and shape of one's own body, which may predict the onset, severity, and treatment outcomes of eating disorders

body image: a person's idea of how his or her body looks

bulimia nervosa: an eating disorder characterized by binge eating and subsequent purging, usually by induced vomiting and/or use of laxatives

cephalocaudal: refers to growth and development that occurs from the head down

circumcision: the surgical removal of the foreskin of the penis

colostrum: the first secretion from the mammary glands after giving birth, rich in antibodies

cortex: the outer layers of the brain in humans and other mammals. Most thinking, feeling, and sensing involves the cortex

co-sleeping: a custom in which parents and their children (usually infants) sleep together in the same room

dendrites: fibers that extend from neurons and receive electrochemical impulses transmitted from other neurons via their axons

dopamine: a neurotransmitter in the brain that plays a role in pleasure and the reward system; increases in the limbic system and later in the prefrontal cortex during adolescence

estrogen: primary female sex hormone that is responsible for the development and regulation of the female reproductive system and secondary sex characteristics

failure to thrive: decelerated or arrested physical growth (height and weight measurements fall below the third or fifth percentile or a downward change in growth across two major growth percentiles) and is associated with abnormal growth and development

fine motor skills: physical abilities involving small body movements, especially of the hands and fingers, such as drawing and picking up a coin. The word "fine" in this context means "small"

frontal lobes: the parts of the brain involved in impulse control, planning, and higher-order thinking; still developing in adolescence

gonad: a sex organ that produces gametes; specifically, a testicle or ovary

gonadarche: refers to the earliest gonadal changes of puberty. In response to pituitary gonadotropins, the ovaries in girls and the

testes in boys begin to grow and increase the production of sex steroids, especially estradiol and testosterone

gross motor skills: voluntary movements including the use of large muscle groups such as the arms and legs. The word "gross" in this context means "big"

immunization: a process that stimulates the body's immune system by causing the production of antibodies to defend against attack by a specific contagious disease

infantile marasmus: starvation due to a lack of calories and protein

kwashiorkor: also known as the "disease of the displaced child," results in a loss of appetite and swelling of the abdomen as the body begins to break down the vital organs as a source of protein

limbic system: structures in the brain (including the amygdala) that involve processing emotional experience and social information and determining rewards and punishments; develops years before the prefrontal cortex

malnutrition: a condition that results from eating a diet in which one or more nutrients are deficient

masturbation: sexual self-stimulation, usually achieved by touching, stroking, or massaging the male or female genitals until this triggers an orgasm

melatonin: sleep hormone whose levels rise later at night and decrease later in the morning for teens, compared to children and adults

menarche: a girl's first menstrual period, signaling that she has begun ovulation. Pregnancy is biologically possible, but ovulation and menstruation are often irregular for years after menarche

milk anemia: an iron deficiency in infants who have been maintained on a milk diet for too long

motor skills: the word "motor" refers to the movement of the muscles. Motor skills refer to our ability to move our bodies and manipulate objects

muscle dysmorphia: sometimes called "reverse anorexia," this is

an obsession with being small and underdeveloped; extreme concern with becoming more muscular

myelin: a coating of fatty tissues around the axon of the neuron

myelination: an aspect of brain maturation in which more myelin is formed around the axons of neurons, thereby increasing neural transmission

neurons: nerve cells in the central nervous system, especially in the brain

neurotransmitters: brain chemicals that carry information from the axon of a sending neuron to the dendrites of a receiving neuron

percentile: a point on a ranking scale of 0 to 100. The 50th percentile is the midpoint; half of the infants in the population being studied rank higher, and half rank lower

perception: the process of interpreting what is sensed

pincer grasp: a developmental milestone that typically occurs at 9 to 12 months of age; the coordination of the index finger and thumb to hold smaller objects; represents a further development of fine motor skills

prefrontal cortex: the area of the cortex at the very front of the brain that specializes in anticipation, planning, and impulse control

primary sex characteristics: the parts of the body that are directly involved in reproduction, including the vagina, uterus, ovaries, testicles, and penis

proximodistal: development that occurs from the center or core of the body in an outward direction

pruning: the process by which unused connections in the brain atrophy and die

puberty: the period of rapid growth and sexual development that begins in adolescence

reflexes: the inborn behavioral patterns that develop during uterine life and are fully present at birth. These are involuntary movements (not learned) or actions that are essential for a newborn's survival immediately after birth and include: sucking, swallowing, blinking, urinating, hiccuping, and defecating

secondary sex characteristics: physical traits that are not directly

involved in reproduction but that indicate sexual maturity, such as a man's beard or a woman's breasts

sensation: the interaction of information with the sensory receptors

serotonin: "calming chemical," a neurotransmitter in the brain involved with the regulation of mood and behavior; serotonin levels increase in the limbic system during adolescence

sexually transmitted infections (STIs): diseases spread by sexual contact, including syphilis, gonorrhea, genital herpes, chlamydia, and HIV/AIDS

spermarche: a boy's first ejaculation of sperm. Erections can occur as early as infancy, but ejaculation signals sperm production. Spermarche may occur during sleep (nocturnal emission or "wet dream") or via direct stimulation

sudden infant death syndrome (SIDS): a situation in which a seemingly healthy infant, usually between 2 and 6 months old, suddenly stops breathing and dies unexpectedly while asleep

synapses: the intersection between the axon of one neuron to the dendrites of another neuron

synaptic pruning: the selective elimination of non-essential synapses and the strengthening of important neural connections

testosterone: the primary male sex hormone that plays a key role in developing male reproductive tissues such as testes and prostate and promoting secondary sexual characteristics such as increased muscle and bone mass and the growth of body hair. Females also produce testosterone, but at a lower level than males

transient exuberance: the great, but temporary increase in the number of dendrites that develop in an infant's brain during the first two years of life

COGNITIVE DEVELOPMENT IN INFANCY THROUGH ADOLESCENCE

Learning outcomes

- Describe each of Piaget's theories and stages of sensorimotor intelligence
- Explain learning and memory abilities in infants and toddlers
- Describe stages of language development during infancy
- Compare theories of language development in toddlers
- Explain the procedure, results, and implications of Hamlin and Wynn's research on moral reasoning in infants
- Illustrate limitations in early childhood thinking, including animism, egocentrism, and conservation errors
- Explain theory of mind
- Explain language development and the importance of language in early childhood and middle childhood
- Describe Vygotsky's model, including the zone of proximal development
- Describe key characteristics of Piaget's concrete

operational intelligence
- Explain the information processing theory of memory
- Evaluate the impact of labeling on children's self-concept and social relationships
- Describe autism spectrum disorders
- Identify common learning disabilities such as dyslexia and attention deficit hyperactivity disorder
- Compare Gardner's theory of multiple intelligences and Sternberg's triarchic theory of intelligence
- Apply the ecological systems model to explore children's experiences in schools
- Describe cognitive abilities and changes during adolescence
- Describe the role of secondary education in adolescent development

In addition to rapid physical growth, young children also exhibit significant development of their cognitive abilities, particularly in language acquisition and in the ability to think and reason. You already learned a little bit about Piaget's theory of cognitive development, and in this section, we'll apply that model to cognitive tasks during infancy and toddlerhood. Piaget described intelligence in infancy as sensorimotor or based on direct, physical contact where infants use senses and motor skills to taste, feel, pound, push, hear, and move in order to experience the world. These basic motor and sensory abilities provide the foundation for the cognitive skills that will emerge during the subsequent stages of cognitive development.

Early childhood is a time of pretending, blending fact and fiction, and learning to think of the world using language. As young children move away from needing to touch, feel, and hear about the world

toward learning basic principles about how the world works, they hold some pretty interesting initial ideas. For example, how many of you are afraid that you are going to go down the bathtub drain? Hopefully, none of you! But a child of three might really worry about this as they sit at the front of the bathtub. A child might protest if told that something will happen "tomorrow" but be willing to accept an explanation that an event will occur "today after we sleep." Or the young child may ask, "How long are we staying? From here to here?" while pointing to two points on a table. Concepts such as tomorrow, time, size and distance are not easy to grasp at this young age. Understanding size, time, distance, fact, and fiction are all tasks that are part of cognitive development in the preschool years.

Children in middle childhood are beginning a new experience—that of formal education. In the United States, formal education begins at a time when children are beginning to think in new and more sophisticated ways. According to Piaget, the child is entering a new stage of cognitive development where they are improving their logical skills. During middle childhood, children also make improvements in short term and long term memory.

Across the world, by the time a child is entering middle childhood, they are being educated in some form or fashion. In western society, most children are enrolled in a formal education program by the time they are in middle childhood.[1] That said, what children learn within that formal education program varies greatly across cultures. Further, most programs are set-up for typically developing children, but they may not be set-up to handle children who are accelerated learners or children with learning disabilities. In this section, we'll take a look at some of these educational differences and developments, as well as struggles and learning difficulties during middle childhood.

1. The World Bank. Primary school starting age (years). Retrieved from https://data.worldbank.org/indicator/SE.PRM.AGES.

Here we learn about adolescent cognitive development. In adolescence, changes in the brain interact with experience, knowledge, and social demands and produce rapid cognitive growth. The changes in how adolescents think, reason, and understand can be even more dramatic than their obvious physical changes. This stage of cognitive development, termed by Piaget as the formal operational stage, marks a movement from the ability to think and reason logically only about concrete, visible events to an ability to also think logically about abstract concepts.

Adolescents are now able to analyze situations logically in terms of cause and effect and to entertain hypothetical situations and entertain what-if possibilities about the world. This higher-level thinking allows them to think about the future, evaluate alternatives, and set personal goals. Although there are marked individual differences in cognitive development among teens, these new capacities allow adolescents to engage in the kind of introspection and mature decision making that was previously beyond their cognitive capacity.

Adolescence is a time of rapid cognitive development. Biological changes in brain structure and connectivity in the brain interact with increased experience, knowledge, and changing social demands to produce rapid cognitive growth. These changes generally begin at puberty or shortly thereafter, and some skills continue to develop as an adolescent ages. Development of executive functions, or cognitive skills that enable the control and coordination of thoughts and behavior, are generally associated with the prefrontal cortex area of the brain. The thoughts, ideas, and concepts developed during this period of life greatly influence one's future life and play a major role in character and personality formation.

There are two primary perspectives on adolescent thinking: constructivist and information-processing. The **constructivist perspective**, based on the work of Piaget, takes a quantitative, stage-theory approach. This view hypothesizes that adolescents' cognitive improvement is relatively sudden and drastic.

The **information-processing perspective** derives from the study of artificial intelligence and explains cognitive development in terms of the growth of specific components of the overall process of thinking, such as attention, memory, processing speed, and metacognition.

Constructivist Theories

Constructivism is a perspective on learning focused on how people actively create (or "construct") knowledge out of experiences. Constructivist models of learning differ about how much a learner constructs knowledge independently, compared to how much he or she takes cues from people who may be more of an expert and who help the learner's efforts (Fosnot, 2005; Rockmore, 2005). These are called **psychological constructivism** (changes in thinking resulting from individual experiences) and **social constructivism** (changes in thinking due to assistance from others), even though both versions are, in a sense, explanations about thinking within individuals.

The Piagetian version of psychological constructivist learning is rather "individualistic," in the sense that it does not say much about how other people involved might assist with learning. Parents and teachers are left lingering on the sidelines with few significant responsibilities for helping learners to construct knowledge. Piaget did recognize the importance of helping others in his theory, calling the process of support or assistance social transmission; however, he did not emphasize this aspect of constructivism. Piaget was more interested in what learners could figure out on their own (Salkind, 2004). Partly for this reason, his theory is often considered less about learning and more about development, which is a long-term change in a person resulting from multiple experiences. For the same reason, educators have often found Piaget's ideas especially helpful for thinking about students' readiness to learn.

Unlike Piaget's rather individually oriented version of constructivism, some psychologists have focused on the interactions between a learner and more knowledgeable individuals. One early expression of this viewpoint came from the American psychologist Jerome Bruner (1960, 1966, 1996), who became convinced that students could usually learn more than had been traditionally expected as long as they were given appropriate

guidance and resources. He called such support instructional scaffolding— literally meaning a temporary framework, like one used in constructing a building, that allows a much stronger structure to be built within it. The reason for such a bold assertion was Bruner's belief in scaffolding—his belief in the importance of providing guidance in the right way and at the right time. When scaffolding is provided, students seem more competent and "intelligent," and they learn more.

Similar ideas were proposed by Lev Vygotsky (1978), whose writing focused on how a learner's thinking is influenced by relationships with others who are more capable, knowledgeable, or expert than the learner. Vygotsky proposed that when a person is learning a new skill or solving a new problem, he or she can perform better if accompanied and helped by an expert than if performing alone—though still not as well as the expert.

The social version of constructivism, however, highlights the responsibility of the expert for making learning possible. He or she must not only have knowledge and skill but also know how to arrange experiences that make it easy and safe for learners to gain knowledge and skill themselves. In addition to knowing what is to be learned, the expert (i.e., the teacher) also has to break the content into manageable parts, offer the parts in a sensible sequence, provide for suitable and successful practice, bring the parts back together again at the end, and somehow relate the entire experience to knowledge and skills already meaningful to the learner.

Psychological Constructivism

In chapter 3, we briefly discussed Piaget and his cognitive development theory. Piaget believed that when we are faced with new information that we experience a cognitive disequilibrium. In response, we are continuously trying to regain cognitive homeostasis through adaptation. Piaget also proposed that through maturation we progress through four stages of cognitive development. As Piaget believed that adolescence was the start of the fourth stage, we will focus on the cognitive developments that occur during this stage.

Adaptation

When it comes to maintaining cognitive equilibrium, young people have much more of a challenge because they are constantly being confronted with new situations. All of this new information needs to be organized. The framework for organizing information is referred to as a **schema.** We develop schemata through the processes of adaptation. Adaptation can occur through assimilation and accommodation.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=89#oembed-8

Video 1. *Semantic Networks and Spreading Activation* explains the creation and use of schemas.

Sometimes when we are faced with new information, we can simply fit it into our current schema; this is called **assimilation.** For example, a student is given a new math problem in class. They use previously learned strategies to try to solve the problem. While the problem is new, the process of solving the problem is something familiar to the student. The new problem fits into their current understanding of the math concept.

Not all new situations fit into our current framework and understanding of the world. In these cases, we may need **accommodation**, which is expanding the framework of knowledge to accommodate the new situation. If the student solving the math problem could not solve it because they were missing the strategies necessary to find the answer, they would first need to learn these strategies, and then they could solve the problem.

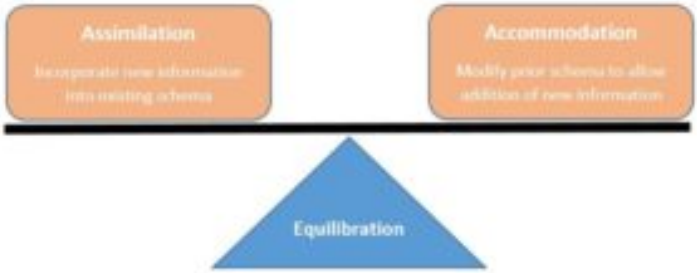

Figure 1. Model of Piaget's adaptation theory.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=89#oembed-1

Video 2. *Schemas, Assimilation, and Accommodation* explains Piaget's theory of constructing schemas through adaptation.

Piaget's Stages of Cognitive Development

Piaget was a **psychological constructivist**: in his view, learning proceeded by the interplay of assimilation (adjusting new experiences to fit prior concepts) and accommodation (adjusting concepts to fit new experiences). The to-and-fro of these two processes leads not only to short-term learning but also to long-term **developmental change**. The long-term developments are really the main focus of Piaget's cognitive theory.

After observing children closely, Piaget proposed that cognition developed through distinct stages from birth through the end of adolescence. By stages he meant a sequence of thinking patterns with four key features:

1. They always happen in the same order.
2. No stage is ever skipped.
3. Each stage is a significant transformation of the stage before it.
4. Each later stage incorporated the earlier stages into itself.

Piaget proposed four major stages of cognitive development and

called them (1) sensorimotor intelligence, (2) preoperational thinking, (3) concrete operational thinking, and (4) formal operational thinking. Each stage is correlated with an age period of childhood, but only approximately.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=89#oembed-9

Video 3. *Piaget's Stages of Cognitive Development* explains the structure of the four stages and major cognitive developments associated with each stage.

Sensorimotor Stage

According to Piaget, children are in the sensorimotor stage from birth until the age of 2. This first stage is defined as the period when infants "think" by means of their senses and motor actions. As every new parent will attest, infants continually touch, manipulate, look, listen to, and even bite and chew objects. According to Piaget, these actions allow them to learn about the world and are crucial to their early cognitive development.

The infant's actions allow the child to represent (or construct simple concepts of) objects and events. A toy animal may be just a

confusing array of sensations at first. However, by looking, feeling, and manipulating it repeatedly, the child gradually organizes her sensations and actions into a stable concept, a *toy animal*. The representation acquires a permanence lacking in the individual experiences of the object, which are constantly changing. Because the representation is stable, the child "knows," or at least believes, that toy animal exists even if the actual *toy animal* is temporarily out of sight. Piaget called this sense of stability **object permanence**, a belief that objects exist whether or not they are actually present. It is a major achievement of sensorimotor development, and marks a qualitative transformation in how older infants (24 months) think about experience compared to younger infants (6 months).

During much of infancy, of course, a child can only barely talk, so sensorimotor development initially happens without the support of language. It might, therefore, seem hard to know what infants are thinking, but Piaget devised several simple, but clever, experiments to get around their lack of language. The results of these experiments suggest that infants do indeed represent objects even without being able to talk (Piaget, 1952). In one, for example, he simply hid an object (like a toy animal) under a blanket. He found that doing so consistently prompts older infants (18–24 months) to search for the object, but fails to prompt younger infants (less than six months) to do so. 'Something' motivates the search by the older infant even without the benefit of language, and the 'something' is presumed to be a permanent concept or representation of the object.

Substages of Sensorimotor Intelligence

For an overview of the substages of sensorimotor thought, it helps to group the six substages into pairs. The first two substages involve the infant's responses to its own body, call **primary circular**

reactions. During the first month first (substage one), the infant's senses, as well motor reflexes are the foundation of thought.

Substage One: *Reflexive Action (Birth through 1st month)*

This active learning begins with automatic movements or reflexes (sucking, grasping, staring, listening). A ball comes into contact with an infant's cheek and is automatically sucked on and licked. But this is also what happens with a sour lemon, much to the infant's surprise! The baby's first challenge is to learn to adapt the sucking reflex to bottles or breasts, pacifiers or fingers, each acquiring specific types of tongue movements to latch, suck, breath, and repeat. This adaptation demonstrates that infants have begun to make sense of sensations. Eventually, the use of these reflexes becomes more deliberate and purposeful as they move onto substage two.

Substage Two: *First Adaptations to the Environment (1st through 4th months)*

Fortunately, within a few days or weeks, the infant begins to discriminate between objects and adjust responses accordingly as reflexes are replaced with voluntary movements. An infant may accidentally engage in a behavior and find it interesting, such as making a vocalization. This interest motivates trying to do it again and helps the infant learn a new behavior that originally occurred by chance. The behavior is identified as circular and primary because it centers on the infant's own body. At first, most actions have to do with the body, but in months to come, will be directed more toward objects. For example, the infant may have different sucking motions for hunger and others for comfort (i.e. sucking a pacifier differently from a nipple or attempting to hold a bottle to suck it).

The next two substages (3 and 4), involve the infant's responses to objects and people, called **secondary circular reactions.** Reactions are no longer confined to the infant's body and are now interactions between the baby and something else.

Substage Three: *Repetition (4th through 8th months)*

During the next few months, the infant becomes more and more actively engaged in the outside world and takes delight in being able to make things happen by responding to people and objects. Babies try to continue any pleasing event. Repeated motion brings particular interest as the infant is able to bang two lids together or shake a rattle and laugh. Another example might be to clap their hands when a caregiver says "patty-cake." Any sight of something delightful will trigger efforts for interaction.

Substage Four: *New Adaptations and Goal-Directed Behavior (8th through 12th months)*

Now the infant becomes more deliberate and purposeful in responding to people and objects and can engage in behaviors that others perform and anticipate upcoming events. Babies may ask for help by fussing, pointing, or reaching up to accomplish tasks, and work hard to get what they want. Perhaps because of continued maturation of the prefrontal cortex, the infant becomes capable of having a thought and carrying out a planned, goal-directed activity such as seeking a toy that has rolled under the couch or indicating that they are hungry. The infant is coordinating both internal and external activities to achieve a planned goal and begins to get a sense of social understanding. Piaget believed that at about 8 months (during substage 4), babies first understood the concept of

object permanence, which is the realization that objects or people continue to exist when they are no longer in sight.

The last two stages (5 and 6), called **tertiary circular reactions**, consist of actions (stage 5) and ideas (stage 6) where infants become more creative in their thinking.

Substage Five: *Active Experimentation of "Little Scientists" (12th through 18th months)*

The toddler is considered a "little scientist" and begins exploring the world in a trial-and-error manner, using motor skills and planning abilities. For example, the child might throw their ball down the stairs to see what happens or delight in squeezing all of the toothpaste out of the tube. The toddler's active engagement in experimentation helps them learn about their world. Gravity is learned by pouring water from a cup or pushing bowls from high chairs. The caregiver tries to help the child by picking it up again and placing it on the tray. And what happens? Another experiment! The child pushes it off the tray again causing it to fall and the caregiver to pick it up again! A closer examination of this stage causes us to really appreciate how much learning is going on at this time and how many things we come to take for granted must actually be learned. This is a wonderful and messy time of experimentation and most learning occurs by trial and error.

Watch It

Video 4. *The Surprisingly Logical Minds of Babies* discusses how even babies think like little scientists.

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Substage Six: *Mental Representations (18th month to 2 years of age)*

The child is now able to solve problems using mental strategies, to remember something heard days before and repeat it, to engage in pretend play, and to find objects that have been moved even when out of sight. Take, for instance, the child who is upstairs in a room with the door closed, supposedly taking a nap. The doorknob has a safety device on it that makes it impossible for the child to turn the knob. After trying several times to push the door or turn the doorknob, the child carries out a mental strategy to get the door opened – he knocks on the door! Obviously, this is a technique learned from the past experience of hearing a knock on the door and observing someone opening the door. The child is now better equipped with mental strategies for problem-solving. Part of this stage also involves learning to use language. This initial movement from the "hands-on" approach to knowing about the world to the more mental world of stage six marked the transition to preoperational thinking, which you'll learn more about in a later module.

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Development of Object Permanence

A critical milestone during the sensorimotor period is the development of object permanence. Introduced during substage 4 above, **object permanence** is the understanding that even if something is out of sight, it continues to exist. The infant is now capable of making attempts to retrieve the object. Piaget thought that, at about 8 months, babies first understand the concept of objective permanence, but some research has suggested that infants seem to be able to recognize that objects have permanence at much younger ages (even as young as 4 months of age). Other researchers, however, are not convinced (Mareschal & Kaufman, 2012).[1] It may

1. Mareshcal, D. & Kauffman, J. (2012). Object Permanence in infancy:

be a matter of "grasping vs. mastering" the concept of objective permanence. Overall, we can expect children to *grasp* the concept that objects continue to exist even when they are not in sight by around 8 months old, but memory may play a factor in their consistency. Because toddlers (i.e., 12–24 months old) have *mastered* object permanence, they enjoy games like hide-and-seek, and they realize that when someone leaves the room they will come back (Loop, 2013). Toddlers also point to pictures in books and look in appropriate places when you ask them to find objects.

Watch It

Video 5. *Object Concept VOE Ramp Study* demonstrates various tests of object permanence. Although the styles and cinematography in this video are dated, the information is valuable in understanding how researchers, like Dr. Rene Baillargeon, study object permanence in young infants.

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Revisiting Baillargeon's drawbridge study. In Alan M. Slaster & Paul C. Quinn (Eds.), Developmental Psychology: Revisiting the classic studies. Thousand Oaks, CA: Sage.

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Preoperational Stage

Remember that Piaget believed that we are continuously trying to maintain balance in how we understand the world. With rapid increases in motor skill and language development, young children are constantly encountering new experiences, objects, and words. In the module covering main developmental theories, you learned that when faced with something new, a child may either assimilate it into an existing schema by matching it with something they already know or expand their knowledge structure to accommodate the new situation. During the preoperational stage, many of the child's existing schemas will be challenged, expanded, and rearranged. Their whole view of the world may shift.

In the **preoperational stage**, children ages 2 to 7 use their new ability to represent objects in a wide variety of activities, but they do not yet do it in ways that are organized or fully logical. One of the most obvious examples of this kind of cognition is **dramatic play**, the improvised make-believe of preschool children. If you have ever had responsibility for children of this age, you have likely witnessed such play. Ashley holds a plastic banana to her ear and says: "Hello,

Mom? Can you be sure to bring me my baby doll? OK!" Then she hangs up the banana and pours tea for Jeremy into an invisible cup. Jeremy giggles at the sight of all of this and exclaims: "Rinnng! Oh Ashley, the phone is ringing again! You better answer it." And on it goes.

In a way, children immersed in make-believe seem "mentally insane," in that they do not think realistically. But they are not truly insane because they have not really taken leave of their senses. At some level, Ashley and Jeremy always know that the banana is still a banana and not *really* a telephone; they are merely *representing* it as a telephone. They are thinking on two levels at once—one imaginative and the other realistic. This dual processing of experience makes dramatic play an early example of **metacognition**, or reflecting on and monitoring of thinking itself. Metacognition is a highly desirable skill for success in school, one that teachers often encourage (Bredekamp & Copple, 1997; Paley, 2005). Partly for this reason, teachers of young children (preschool, kindergarten, and even first or second grade) often make time and space in their classrooms for dramatic play, and sometimes even participate in it themselves to help develop the play further.

Egocentrism

Egocentrism in early childhood refers to the tendency of young children to think that everyone sees things in the same way as the child. Piaget's classic experiment on egocentrism involved showing children a three-dimensional model of a mountain and asking them to describe what a doll that is looking at the mountain from a different angle might see. Children tend to choose a picture that represents their own, rather than the doll's view. However, when children are speaking to others, they tend to use different sentence structures and vocabulary when addressing a younger child or an older adult. Consider why this difference might be observed. Do you

think this indicates some awareness of the views of others? Or do you think they are simply modeling adult speech patterns?

Watch It

Video 6. *Egocentrism and Perspective Taking* demonstrates a classic Piagetian task to assess egocentrism in a child. The task involves the child and the adult looking at a 3-dimensional model from one perspective and the child noting the objects they can see. The child and adult then switch positions. The child is asked to note what they see from their new position but then asked what the adult is now seeing from their perspective. The child was in that same seat only moments ago and should remember what they saw, but will they be able to imagine the adult's perspective? The first boy in this interview display egocentrism by believing that the adult sees the same thing as they do, even after switching positions. The second boy can take the adult's perspective, demonstrating that they no longer fall prey to egocentrism.

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Precausal Thinking

Similar to preoperational children's egocentric thinking is their structuring of cause-and-effect relationships based on their limited view of the world. Piaget coined the term "precausal thinking" to describe the way in which preoperational children use their own existing ideas or views, like in egocentrism, to explain cause-and-effect relationships. Three main concepts of causality, as displayed by children in the preoperational stage, include animism, artificialism, and transductive reasoning.

Animism is the belief that inanimate objects are capable of actions and have lifelike qualities. An example could be a child believing that the sidewalk was mad and made them fall down, or that the stars twinkle in the sky because they are happy. To an imaginative child, the cup may be alive, the chair that falls down and hits the child's ankle is mean, and the toys need to stay home because they are tired. Young children do seem to think that objects that move may be alive, but after age three, they seldom refer to objects as being alive (Berk, 2007). Many children's stories and movies capitalize on animistic thinking. Do you remember some of the classic stories that make use of the idea of objects being alive and engaging in lifelike actions?

Artificialism refers to the belief that environmental characteristics can be attributed to human actions or interventions. For example, a child might say that it is windy outside because someone is blowing very hard, or the clouds are white because someone painted them that color.

Finally, precausal thinking is categorized by transductive reasoning. **Transductive reasoning** is when a child fails to understand the true relationships between cause and effect. Unlike deductive or inductive reasoning (general to specific, or specific to general), transductive reasoning refers to when a child reasons from specific to specific, drawing a relationship between two separate events that are otherwise unrelated. For example, if a child hears

a dog bark and then a balloon pop, the child would conclude that because the dog barked, the balloon popped. Related to this is **syncretism,** which refers to a tendency to think that if two events occur simultaneously, one caused the other. An example of this might be a child asking the question, "if I put on my bathing suit will it turn to summer?"

Cognition Errors

Between about the ages of four and seven, children tend to become very curious and ask many questions, beginning the use of primitive reasoning. There is an increase in curiosity in the interest of reasoning and wanting to know why things are the way they are. Piaget called it the "intuitive substage" because children realize they have a vast amount of knowledge, but they are unaware of how they acquired it.

Centration and conservation are characteristic of preoperative thought. **Centration** is the act of focusing all attention on one characteristic or dimension of a situation while disregarding all others. An example of centration is a child focusing on the *number* of pieces of cake that each person has, regardless of the size of the pieces. Centration is one of the reasons that young children have difficulty understanding the concept of conservation. **Conservation** is the awareness that altering a substance's appearance does not change its basic properties. Children at this stage are unaware of conservation and exhibit centration. Imagine a 2-year-old and 4-year-old eating lunch. The 4-year-old has a whole peanut butter and jelly sandwich. He notices, however, that his younger sister's sandwich is cut in half and protests, "She has more!" He is exhibiting centration by focusing on the number of pieces, which results in a conservation error.

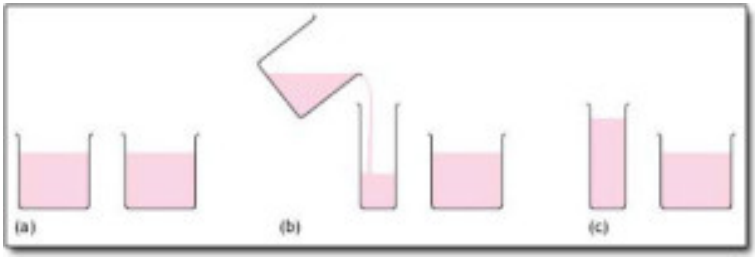

Figure 2. *A demonstration of the conservation of liquid. Does pouring liquid in a tall, narrow container make it have more?*

In Piaget's famous conservation task, a child is presented with two identical beakers containing the same amount of liquid. The child usually notes that the beakers do contain the same amount of liquid. When one of the beakers is poured into a taller and thinner container, children who are younger than seven or eight years old typically say that the two beakers no longer contain the same amount of liquid, and that the taller container holds the larger quantity (centration), without taking into consideration the fact that both beakers were previously noted to contain the same amount of liquid.

Irreversibility is also demonstrated during this stage and is closely related to the ideas of centration and conservation. **Irreversibility** refers to the young child's difficulty mentally reversing a sequence of events. In the same beaker situation, the child does not realize that, if the sequence of events was reversed and the water from the tall beaker was poured back into its original beaker, then the same amount of water would exist.

Centration, conservation errors, and irreversibility are indications that young children are reliant on visual representations. Another example of children's reliance on visual representations is their misunderstanding of "less than" or "more than". When two rows containing equal amounts of blocks are placed in front of a child with one row spread farther apart than the other, the child will think that the row spread farther contains more blocks.

Watch IT

Video 7. *Conservation* is demonstrated in this video. The young children struggle with the concept of conservation and demonstrate irreversibility.

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Class inclusion refers to a kind of conceptual thinking that children in the preoperational stage cannot yet grasp. Children's inability to focus on two aspects of a situation at once (centration) inhibits them from understanding the principle that one category or class can contain several different subcategories or classes. Preoperational children also have difficulty understanding that an object can be classified in more than one way. For example, a four-year-old girl may be shown a picture of eight dogs and three cats. The girl knows what cats and dogs are, and she is aware that they are both animals. However, when asked, "Are there more dogs or more animals?" she is likely to answer "more dogs." This is due to her difficulty focusing on the two subclasses and the larger class all at the same time. She may have been able to view the dogs as dogs or animals, but struggled when trying to classify them as both, simultaneously. Similar to this is a concept relating to intuitive thought, known as "transitive inference."

Transitive inference is using previous knowledge to determine the missing piece, using basic logic. Children in the preoperational stage lack this logic. An example of transitive inference would be when a child is presented with the information "A" is greater than "B" and "B" is greater than "C." The young child may have difficulty understanding that "A" is also greater than "C."

As the child's vocabulary improves and more schemes are developed, they are more able to think logically, demonstrate an understanding of conservation, and classify objects.

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Theory of Mind

***Figure 3**. Around age four, most children begin to understand that thoughts and realities do not always match.*

How do we come to understand how our mind works? The **theory of mind** is the understanding that the mind holds people's beliefs, desires, emotions, and intentions. One component of this is understanding that the mind can be tricked or that the mind is not always accurate.

A two-year-old child does not understand very much about how their mind works. They can learn by imitating others, they are starting to understand that people do not always agree on things they like, and they have a rudimentary understanding of cause and effect (although they often fall prey to transitive reasoning). By the time a child is four, their theory of the mind allows them to understand that people think differently, have different preferences, and even mask their true feelings by putting on a different face that differs from how they truly feel inside.

To think about what this might look like in the real world, imagine showing a three-year-old child a bandaid box and asking the child what is in the box. Chances are, the child will reply, "bandaids." Now imagine that you open the box and pour out crayons. If you now ask the child what they thought was in the box before it was opened, they may respond, "crayons." If you ask what a friend would have thought was in the box, the response would still be "crayons." Why?

Before about four years of age, a child does not recognize that the mind can hold ideas that are not accurate, so this three-year-old changes their response once shown that the box contains crayons. The child's response can also be explained in terms of egocentrism and irreversibility. The child's response is based on their current

view rather than seeing the situation from another person's perspective (egocentrism) or thinking about how they arrived at their conclusion (irreversibility). At around age four, the child would likely reply, "bandaids" when asked after seeing the crayons because by this age a child is beginning to understand that thoughts and realities do not always match.

Watch It

Video 8. *The Theory of Mind Test* demonstrates several versions of the false belief test to assess the theory of mind in young children.

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Theory of Mind and Social Intelligence

This awareness of the existence of mind is part of social intelligence and the ability to recognize that others can think differently about situations. It helps us to be self-conscious or aware that others can think of us in different ways, and it helps us to be able to be understanding or empathic toward others. This developing social

intelligence helps us to anticipate and predict the actions of others (even though these predictions are sometimes inaccurate). The awareness of the mental states of others is important for communication and social skills. A child who demonstrates this skill is able to anticipate the needs of others.

Impaired Theory of Mind in Individuals with Autism

People with autism or an autism spectrum disorder (ASD) typically show an impaired ability to recognize other people's minds. Under the DSM-5, **autism** is characterized by persistent deficits in social communication and interaction across multiple contexts, as well as restricted, repetitive patterns of behavior, interests, or activities. These deficits are present in early childhood, typically before age three, and lead to clinically significant functional impairment. Symptoms may include lack of social or emotional reciprocity, stereotyped and repetitive use of language or idiosyncratic language, and persistent preoccupation with unusual objects.

About half of parents of children with ASD notice their child's unusual behaviors by age 18 months, and about four-fifths notice by age 24 months, but often a diagnoses comes later, and individual cases vary significantly. Typical early signs of autism include:

- No babbling by 12 months.
- No gesturing (pointing, waving, etc.) by 12 months.
- No single words by 16 months.
- No two-word (spontaneous, not just echolalic) phrases by 24 months.
- Loss of any language or social skills, at any age.

Children with ASD experience difficulties with explaining and predicting other people's behavior, which leads to problems in social

communication and interaction. Children who are diagnosed with an autistic spectrum disorder usually develop the theory of mind more slowly than other children and continue to have difficulties with it throughout their lives.

For testing whether someone lacks the theory of mind, the *Sally-Anne* test is performed. The child sees the following story: Sally and Anne are playing. Sally puts her ball into a basket and leaves the room. While Sally is gone, Anne moves the ball from the basket to the box. Now Sally returns. The question is: where will Sally look for her ball? The test is passed if the child correctly assumes that Sally will look in the basket. The test is failed if the child thinks that Sally will look in the box. Children younger than four and older children with autism will generally say that Sally will look in the box.

Watch It

Video 9. *Sally Anne Test* demonstrates a false belief test, but this time with an autistic child. Notice the response of this child compared to the children in video 8.

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Concrete Operational Stage

As children continue into elementary school, they become able to represent ideas and events more flexibly and logically. Their rules of thinking still seem very basic by adult standards and usually operate unconsciously, but they allow children to solve problems more systematically than before, and therefore to be successful with many academic tasks. In the concrete operational stage, for example, a child may unconsciously follow the rule: "If nothing is added or taken away, then the amount of something stays the same." This simple principle helps children to understand certain arithmetic tasks, such as in adding or subtracting zero from a number, as well as to do certain classroom science experiments, such as ones involving judgments of the amounts of liquids when mixed. Piaget called this period the **concrete operational stage** because children mentally "operate" on concrete objects and events. The word concrete refers to that which is tangible; that which can be seen or touched or experienced directly. The concrete operational child is able to make use of logical principles in solving problems involving the physical world. For

example, the child can understand the principles of cause and effect, size, and distance.

Concrete operational thinking differs from preoperational thinking in two ways, each of which renders children more skilled as students. One difference is **reversibility**, or the ability to think about the steps of a process in any order. Water can be frozen and then thawed to become liquid again. But eggs cannot be unscrambled. Arithmetic operations are reversible as well: 2 + 3 = 5 and 5 – 3 = 2. Many of these cognitive skills are incorporated into the school's curriculum through mathematical problems and in worksheets about which situations are reversible or irreversible. Imagine a simple science experiment, for example, such as one that explores why objects sink or float by having a child place an assortment of objects in a basin of water. Both the preoperational and concrete operational child can recall and describe the steps in this experiment, but only the concrete operational child can recall them *in any order*. This skill is beneficial for any task involving multiple steps—a common feature of tasks in the classroom. In teaching new vocabulary from a story, for another example, a teacher might tell students: "First make a list of words in the story that you do not know, then find and write down their definitions, and finally get a friend to test you on your list." These directions involve repeatedly remembering to move back and forth between a second step and a first—a task that concrete operational students—and most adults—find easy, but that preoperational children often forget to do or find confusing. If the younger children are to do this task reliably, they may need external prompts, such as having the teacher remind them periodically to go back to the story to look for more unknown words

The other new feature of thinking during the concrete operational stage is the child's ability to **decenter** or focus on more than one feature of a problem at a time. There are hints of decentration in preschool children's dramatic play, which requires being aware on two levels at once—knowing that a banana can be both a banana and a "telephone." The decentration of the concrete operational stage

is more deliberate and conscious than preschoolers' make-believe. Now the child can attend to two things at once quite purposely. Suppose you give students a sheet with an assortment of subtraction problems on it and ask them to do this: "Find all of the problems that involve two-digit subtraction *and* that involve borrowing from the next column. Circle and solve *only* those problems." Following these instructions is quite possible for a concrete operational student (as long as they have been listening!) because the student can attend to the two subtasks simultaneously—finding the two-digit problems *and* identifying which involve borrowing.

As children's experiences and vocabularies grow, they build schema and are able to classify objects in many different ways. **Classification** can include new ways of arranging information, categorizing information, or creating classes of information. Many psychological theorists, including Piaget, believe that classification involves a hierarchical structure, such that information is organized from very broad categories to very specific items.

Classification

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In real classroom tasks, reversibility and decentration often happen

together. A well-known example of joint presence is Piaget's experiments with **conservation**, the belief that an amount or quantity stays the same even if it changes apparent size or shape (Piaget, 2001; Matthews, 1998). Imagine two identical balls made of clay. Any child, whether preoperational or concrete operational, will agree that the two indeed have the same amount of clay in them simply because they look the same. However, if you now squish one ball into a long, thin "hot dog," the preoperational child is likely to say that the amount of that ball has changed—either because it is longer or because it is thinner, but at any rate, because it now looks different. The concrete operational child will not make this mistake, thanks to new cognitive skills of reversibility and decentration. For this child, the amount is the same because "you could squish it back into a ball again" (reversibility) and because "it may be longer, but it is also thinner" (decentration). Piaget would say the concrete operational child "has conservation of quantity."

The classroom examples described above also involve reversibility and decentration. As already mentioned, the vocabulary activity described earlier requires reversibility (going back and forth between identifying words and looking up their meanings). However, it can also be construed as an example of decentration. Furthermore, as mentioned, the arithmetic activity requires decentration (looking for problems that meet two criteria *and* also solving them). However, it can also be construed as an example of reversibility (going back and forth between subtasks, as with the vocabulary activity). Either way, the development of concrete operational skills support students in doing many basic academic tasks; in a sense, they make ordinary schoolwork possible.

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Formal Operational Stage

In the fourth (and last) of the Piagetian stages, an adolescent becomes able to reason not only about tangible objects and events, as younger children do, but also about hypothetical or abstract ones. Hence this stage is named the **formal operational** stage—the period when the individual can "operate" on "forms" or representations.

During the formal operational stage, adolescents can understand **abstract principles** that have no physical reference. They can now contemplate such abstract constructs as beauty, love, freedom, and morality. The adolescent is no longer limited by what can be directly seen or heard. Additionally, while younger children solve problems through trial and error, adolescents demonstrate **hypothetical-deductive reasoning**, which is developing hypotheses based on what might logically occur. They can think about all the possibilities in a situation beforehand, and then test them systematically (Crain, 2005). Now they can engage in real scientific thinking. Formal operational thinking also involves accepting hypothetical situations. Adolescents understand the concept of **transitivity**, which means that a relationship between two elements is carried over to other elements logically related to the first two, such as if A<B and B<C, then A<C (Thomas, 1979). For example, when asked: If Maria is shorter than Alicia and Alicia is shorter than Caitlyn, who is the

shortest? Adolescents can answer the question correctly as they understand the transitivity involved.

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> https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=89#oembed-18

Video 10. *Formal Operational Stage* explains some of the cognitive development consistent with formal operational thought.

Abstract and Hypothetical Thinking

One of the major premises of formal operational thought is the capacity to think of possibility, not just reality. Adolescents' thinking is less bound to concrete events than that of children; they can contemplate possibilities outside the realm of what currently exists. One manifestation of the adolescent's increased facility with thinking about possibilities is the improvement of skill in **deductive reasoning (also called top-down reasoning),** which leads to the development of **hypothetical thinking**. This development provides the ability to plan ahead, see the future consequences of an action, and provide alternative explanations of events. It also makes adolescents more skilled debaters, as they can reason against a friend's or parent's assumptions. Adolescents also develop a more sophisticated understanding of probability.

This appearance of more systematic, abstract thinking allows adolescents to comprehend the sorts of higher-order abstract logic inherent in puns, proverbs, metaphors, and analogies. Their increased facility permits them to appreciate how language can

be used to convey multiple messages, such as satire, metaphor, and sarcasm (children younger than age nine often cannot comprehend sarcasm). This development also permits the application of advanced reasoning and logical processes to social and ideological matters such as interpersonal relationships, politics, philosophy, religion, morality, friendship, faith, fairness, and honesty.

Deductive Reasoning

Video 11. *Deductive Reasoning* demonstrates a Piagetian task that presents the child with a hypothetical situation and asks that they deduce what happens given this scenario. The first child is an elementary school-aged child. The second is an adolescent. You can see how these two manage hypothetical information differently to make predictions about what will happen next.

https://youtu.be/YJyuy4B2aKU

Intuitive and Analytic Thinking

Piaget emphasized the sequence of thought throughout four stages. Others suggest that thinking does not develop in sequence, but instead, that advanced logic in adolescence may be influenced by intuition. Cognitive psychologists often refer to intuitive and analytic thought as the **dual-process model**, the notion that humans have two distinct networks for processing information (Kuhn, 2013.) **Intuitive thought** is automatic, unconscious, and fast, and it is more experiential and emotional.

In contrast, **analytic thought** is deliberate, conscious, and rational (logical). While these systems interact, they are distinct (Kuhn, 2013). Intuitive thought is easier, quicker, and more commonly used in everyday life. As discussed in the adolescent brain development section, the discrepancy between the maturation of the limbic system and the prefrontal cortex may make teens more prone to emotional, intuitive thinking than adults. As adolescents develop, they gain in logic/analytic thinking ability and sometimes regress, with social context, education, and experiences becoming significant influences. Simply put, being "smarter," as measured by an intelligence test, does not advance cognition as much as having more experience, in school and life (Klaczynski & Felmban, 2014).

Relativistic Thinking

Adolescents are more likely to engage in **relativistic thinking**—in other words, they are more likely to question others' assertions and less likely to accept information as absolute truth. Through experience outside the family circle, they learn that rules they were taught as absolute are relativistic. They begin to differentiate between rules crafted from common sense (do not touch a hot stove) and those that are based on culturally relative standards (codes of etiquette). This can lead to a period of questioning authority in all domains.

Formal Operational Thinking In the Classroom

School is a main contributor in guiding students towards formal operational thought. With students at this level, the

teacher can pose hypothetical (or contrary-to-fact) problems: "What if the world had never discovered oil?" or "What if the first European explorers had settled first in California instead of on the East Coast of the United States?" To answer such questions, students must use hypothetical reasoning, meaning that they must manipulate ideas that vary in several ways at once and do so entirely in their minds.

The hypothetical reasoning that concerned Piaget primarily involved scientific problems. His studies of formal operational thinking therefore often look like problems that middle or high school teachers pose in science classes. In one problem, for example, a young person is presented with a simple pendulum, to which different amounts of weight can be hung (Inhelder & Piaget, 1958). The experimenter asks: "What determines how fast the pendulum swings: the length of the string holding it, the weight attached to it, or the distance that it is pulled to the side?" The young person is not allowed to solve this problem by trial-and-error with the materials themselves but must reason a way to the solution mentally. To do so systematically, he or she must imagine varying each factor separately, while also imagining the other factors that are held constant. This kind of thinking requires facility at manipulating mental representations of the relevant objects and actions—precisely the skill that defines formal operations.

As you might suspect, students with an ability to think hypothetically have an advantage in many kinds of schoolwork: by definition, they require relatively few "props" to solve problems. In this sense, they can in principle be more self-directed than students who rely only

on concrete operations—certainly a desirable quality in the opinion of most teachers. Note, though, that formal operational thinking is desirable but not sufficient for school success, and that it is far from being the only way that students achieve educational success. Formal thinking skills do not ensure that a student is motivated or well-behaved, for example, nor does it guarantee other desirable skills. The fourth stage in Piaget's theory is really about a particular kind of formal thinking, the kind needed to solve scientific problems and devise scientific experiments. Since many people do not normally deal with such problems in the normal course of their lives, it should be no surprise that research finds that many people never achieve or use formal thinking fully or consistently, or that they use it only in selected areas with which they are very familiar (Case & Okomato, 1996). For teachers, the limitations of Piaget's ideas suggest a need for additional theories about development—ones that focus more directly on the social and interpersonal issues of childhood and adolescence.

Adolescent Egocentrism

Once adolescents can understand abstract thoughts, they enter a world of hypothetical possibilities and demonstrate **egocentrism** or a heightened self-focus. The egocentricity comes from attributing unlimited power to their own thoughts (Crain, 2005). Piaget believed it was not until

adolescents took on adult roles that they would be able to learn the limits to their own thoughts.

David Elkind (1967) expanded on the concept of Piaget's adolescent egocentricity. Elkind theorized that the physiological changes that occur during adolescence result in adolescents being primarily concerned with themselves. Additionally, since adolescents fail to differentiate between what others are thinking and their own thoughts, they believe that others are just as fascinated with their behavior and appearance. This belief results in the adolescent anticipating the reactions of others, and consequently constructing an imaginary audience. "The **imaginary audience** is the adolescent's belief that those around them are as concerned and focused on their appearance as they themselves are" (Schwartz, Maynard, & Uzelac, 2008, p. 441). Elkind thought that the imaginary audience contributed to the self-consciousness that occurs during early adolescence. The desire for privacy and reluctance to share personal information may be a further reaction to feeling under constant observation by others.

Another important consequence of adolescent egocentrism is the **personal fable** or belief that one is unique, special, and invulnerable to harm. Elkind (1967) explains that because adolescents feel so important to others (imaginary audience), they regard themselves and their feelings as being special and unique. Adolescents believe that only they have experienced strong and diverse emotions, and therefore others could never understand how they feel. This uniqueness in one's emotional experiences reinforces the adolescent's belief of invulnerability, especially to death. Adolescents will engage in risky behaviors, such as drinking and driving or unprotected sex, and feel they will not suffer any negative consequences. Elkind believed that adolescent egocentricity emerges in early adolescence and declines in middle adolescence. However, recent research has also identified egocentricity in late adolescence (Schwartz et al., 2008).

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Consequences of Formal Operational Thought

As adolescents are now able to think abstractly and hypothetically, they exhibit many new ways of reflecting on information (Dolgin, 2011). For example, they demonstrate greater **introspection** or thinking about one's thoughts and feelings. They begin to imagine how the world could be, which leads them to become **idealistic** or to insist upon high standards of behavior. Because of their idealism, they may become critical of others, especially adults in their life. Additionally, adolescents can demonstrate **hypocrisy**, or pretend to be what they are not. Since they can recognize what others expect of them, they will conform to those expectations for their emotions and behavior seemingly hypocritical to themselves. Lastly, adolescents can exhibit **pseudostupidity.** This is when they approach problems at a level that is too complex and they fail

because the tasks are too simple. Their new ability to consider alternatives is not completely under control and they appear "stupid" when they are, in fact, bright, just not experienced.

Criticisms of Piaget's Theories

Researchers during the 1960's and 1970's identified shortcomings in Piaget's theory. First, critics argue that by describing tasks with confusing abstract terms and using overly difficult tasks, Piaget underestimated children's abilities. Researchers have found that young children can succeed on simpler forms of tasks requiring the same skills. Second, Piaget's theory predicts that thinking within a particular stage would be similar across tasks. In other words, preschool children should perform at the preoperational level in all cognitive tasks. Research has shown diversity in children's thinking across cognitive tasks. Third, according to Piaget, efforts to teach children developmentally advanced concepts would be unsuccessful. Researchers have found that in some instances, children often learn more advanced concepts with relatively brief instruction. Researchers now believe that children may be more competent than Piaget originally thought, especially in their practical knowledge.

Beyond Formal Operational Thought: Postformal Thought

According to Piaget's theory, adolescents acquire formal operational thought and this is the last stage of cognitive development. The hallmark of this type of thinking is the ability to think abstractly or to consider possibilities and ideas about circumstances never

directly experienced. Thinking abstractly is only one characteristic of adult thought, however. If you compare a 15-year-old with someone in their late 30s, you would probably find that the latter considers not only what is possible but also what is likely. Why the change? The adult has gained experience and understands why possibilities do not always become realities. They learn to base decisions on what is realistic and practical, not idealistic, and can make adaptive choices. Adults are also not as influenced by what others think. This advanced type of thinking is referred to as **postformal thought** (Sinnott, 1998).

In addition to moving toward more practical considerations, thinking in early adulthood may also become more flexible and balanced. Abstract ideas that the adolescent believes in firmly may become standards by which the adult evaluates reality. Adolescents tend to think in **dichotomies**; ideas are true or false; good or bad; there is no middle ground. However, with experience, the adult comes to recognize that there are some right and some wrong in each position, some good or some bad in a policy or approach, some truth and some falsity in a particular idea. This ability to bring together salient aspects of two opposing viewpoints or positions is referred to as **dialectical thought** and is considered one of the most advanced aspects of postformal thinking (Basseches, 1984). Such thinking is more realistic because very few positions, ideas, situations, or people are completely right or wrong. So, for example, parents who were considered angels or devils by the adolescent eventually become just people with strengths and weaknesses, endearing qualities, and faults to the adult.

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Video 12. *Perry's Stages of Intellectual Development* explains post-formal stages of cognitive development in adulthood.

Does Everyone Reach Formal Operational or Postformal Thought?

Formal operational thought is influenced by experience and education. Most people attain some degree of formal operational thinking but use formal operations primarily in the areas of their strongest interest (Crain, 2005). Even those that can use formal or postformal thought, they do not regularly demonstrate it. In some small villages and tribal communities, it is barely used at all. A possible explanation is that an individual's thinking has not been sufficiently challenged to demonstrate formal operational thought in all areas.

Some adults lead lives in which they are not challenged to think abstractly about their world. Many adults do not receive any formal education and are not taught to think abstractly about situations they have never experienced. Further, they are also not exposed to conceptual tools used to formally analyze hypothetical situations. Those who do think abstractly, in fact, may be able to do so more easily in some subjects than others. For example, psychology majors may be able to think abstractly about psychology, but be unable to use abstract reasoning in physics or chemistry. Abstract reasoning in a particular field requires a knowledge base that we might not have in all areas. Consequently, our ability to think abstractly depends to a large extent on our experiences.

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Social Constructivism

Lev Vygotsky (1896-1934) was a Russian psychologist whose **sociocultural theory** emphasizes the importance of culture and interaction in the development of cognitive abilities. Vygotsky differed with Piaget in that he believed that a person has not only a set of abilities but also a set of potential abilities that can be realized if given the proper guidance from others. Vygotsky developed theories on teaching that have been adopted by educators today.

Like Piaget, Vygotsky acknowledged intrinsic development, but he argued that it is the language, writings, and concepts arising from the culture that elicit the highest level of cognitive thinking (Crain, 2005). He believed that social interactions with teachers and more learned peers could facilitate a learner's potential for learning. Without this interpersonal instruction, he believed learner's minds would not advance very far as their knowledge would be based only on their own discoveries.

Figure 1. Lev Vygotsky

Zone of Proximal Development and Scaffolding

Vygotsky's best-known concept is the **Zone of Proximal Development (ZPD). The** ZPD has been defined as "the distance

between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Vygotsky stated that learners should be taught in the ZPD. A good teacher or more-knowledgable-other (MKO) identifies a learner's ZPD and helps them stretch beyond it. Then the MKO gradually withdraws support until the learner can perform the task unaided. Other psychologists have applied the metaphor of scaffolds (the temporary platforms on which construction workers stand) to Vygotsky's theory. Scaffolding is the temporary support that a MKO gives a learner to do a task.

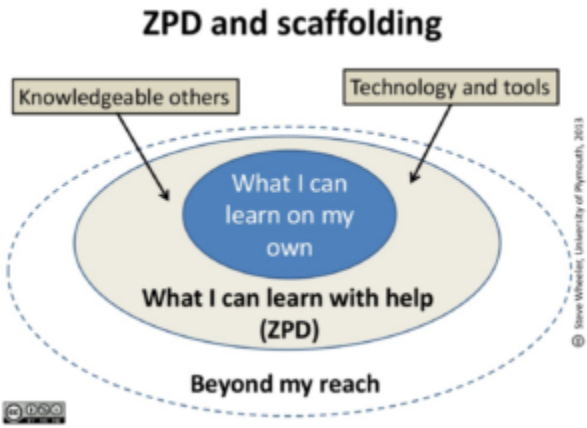

Figure 2. Model of Vygotsky's zone of proximal development.

Thought and Speech

Do you ever talk to yourself? Why? Chances are, this occurs when you are struggling with a problem, trying to remember something,

or feel very emotional about a situation. Children talk to themselves too. Piaget interpreted this as **egocentric speech** or a practice engaged in because of a child's inability to see things from another's point of view. Vygotsky, however, believed that children talk to themselves in order to solve problems or clarify thoughts. As children learn to think in words, they do so aloud, referred to as **private speech**, speech meant only for one's self. Eventually, thinking out loud becomes thought accompanied by internal speech, and talking to oneself becomes a practice only engaged in when we are trying to learn something or remember something. This inner speech is not as elaborate as the speech we use when communicating with others (Vygotsky, 1962).

Vygotsky's Influence on Education

Video 1. *Vygotsky's Developmental Theory* introduces the applications of the theory in the classroom. Vygotsky's theories have been extremely influential for education. Although Vygotsky himself never mentioned the term scaffolding, it is often credited to him as a continuation of his ideas pertaining to the way adults or other children can use guidance in order for a child to work within their ZPD. (The term scaffolding was first developed by Jerome Bruner, David Wood, and Gail Ross while applying Vygotsky's concept of ZPD to various educational contexts.)

Educators often apply these concepts by assigning tasks that students cannot do on their own, but which they can do with assistance; they should provide just enough assistance so that students learn to complete the tasks independently and then provide an environment that enables students to do harder tasks than would otherwise

be possible. Teachers can also allow students with more knowledge to assist students who need more guidance. Especially in the context of collaborative learning, group members who have higher levels of understanding can help the less advanced members learn within their zone of proximal development.

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Contrasting Paget and Vygotsky

Piaget was highly critical of teacher-directed instruction believing that teachers who take control of the child's learning place the child into a passive role (Crain, 2005). Further, teachers may present abstract ideas without the child's true understanding, and instead, they just repeat back what they heard. Piaget believed children must be given opportunities to discover concepts on their own. As previously stated, Vygotsky did not believe children could reach a higher cognitive level without instruction from more learned individuals. Who is correct? Both theories certainly contribute to our understanding of how children learn.

Information Processing Theory

Information Processing is not the work of a single theorist, but based on the ideas and research of several cognitive scientists studying how individuals perceive, analyze, manipulate, use, and remember information. This approach assumes that humans gradually improve in their processing skills; that is, development is continuous rather than stage-like. The more complex mental skills of adults are built from the primitive abilities of children. We are born with the ability to notice stimuli, store, and retrieve information. Brain maturation enables advancements in our information processing system. At the same time, interactions with the environment also aid in our development of more effective strategies for processing information.

Improvements in basic thinking abilities generally occur in five areas during adolescence:

- *Attention*. Improvements are seen in **selective attention**(the process by which one focuses on one stimulus while tuning out another), as well as **divided attention** (the ability to pay attention to two or more stimuli at the same time).
- *Memory*. Improvements are seen in working memory and long-term memory.
- *Processing Speed*. Adolescents think more quickly than children. Processing speed improves sharply between age five and middle adolescence, levels off around age 15, and does not appear to change between late adolescence and adulthood.
- *Organization of Thinking*. Adolescents are more planful, they approach problems with strategy, and are flexible in using different strategies in different situations.
- *Metacognition*. Adolescents can think about thinking itself. This

often involves monitoring one's own cognitive activity during the thinking process. **Metacognition**provides the ability to plan ahead, see the future consequences of an action, and provide alternative explanations of events.

Attention

Changes in attention have been described by many as the key to changes in human memory (Nelson & Fivush, 2004; Posner & Rothbart, 2007). However, attention is not a unified function; it is comprised of sub-processes. O*ur ability to focus on a single task or stimulus, while ignoring distracting information*, called **selective attention**. There is a sharp improvement in selective attention from age six into adolescence (Vakil, Blachstein, Sheinman, & Greenstein, 2009). S**ustained attention** is *the ability to stay on task for long periods of time. The ability to switch our focus between tasks or external stimuli* is called **divided attention** or **multitasking, which** also improves into adolescence (Carlson, Zelazo, & Faja, 2013).

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Video 1. *Attention* explains the ways in which we may attend or fail to attend to stimuli.

Selective Attention

The ability with selective attention tasks improves through childhood and into adolescence. While children's selective attention may be inconsistent during middle childhood, adolescents demonstrate the ability to reliably select and prioritize stimuli for attention. The development of this ability is influenced by the child's temperament (Rothbart & Rueda, 2005), the complexity of the stimulus or task (Porporino, Shore, Iarocci & Burack, 2004), and may be dependent on whether the stimuli are visual or auditory (Guy, Rogers & Cornish, 2013). Guy et al. (2013) found that children's ability to selectively attend to visual information outpaced that of auditory stimuli. This may explain why young children are not able to hear the voice of the teacher over the cacophony of sounds in the typical preschool classroom (Jones, Moore & Amitay, 2015). Jones and his colleagues found that 4 to 7 year-olds could not filter out background noise, especially when its frequencies were close in sound to the target sound. In comparison, teens often performed similarly to adults.

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Video 2. *Theories of Selective Attention* explains how and why we attend to some stimuli and not others.

Sustained Attention

Most measures of sustained attention typically ask individuals to spend several minutes focusing on one task, while waiting for an infrequent event, while there are multiple distractors for several minutes. Common estimates of the attention span of healthy teenagers and adults range from 10 to 20 minutes. There is some debate as to whether attention is consistently sustained or whether people repeatedly choose to re-focus on the same thing (Raichle, 1999) This ability to renew attention permits people to 'pay attention' to things that last for more than a few minutes.

For time-on-task measurements, the type of activity used in the test affects the results, as people are generally capable of a longer attention span when they are doing something that they find enjoyable or intrinsically motivating (Raichle,1999) Attention is also increased if the person is able to perform the task fluently, compared to a person who has difficulty performing the task, or to the same person when he or she is just learning the task. Fatigue, hunger, noise, and emotional stress reduce the time focused on the task. After losing attention from a topic, a person may restore it by resting, doing a different kind of activity, changing mental focus, or deliberately choosing to re-focus on the first topic.

Divided Attention

Divided attention can be thought of in a couple of ways. We may look at how well people are able to multitask, performing two or more tasks simultaneously, or how people are able to alternate attention between two or more tasks. For example, walking and talking to a friend at the same time is multitasking, where trying to text while driving requires us to quickly alternate attention between two tasks.

Young children (age 3-4) have considerable difficulties in dividing their attention between two tasks, and often perform at levels equivalent to our closest relative, the chimpanzee, but by age five they have surpassed the chimp (Hermann, Misch, Hernandez-Lloreda & Tomasello, 2015; Hermann & Tomasello, 2015). Despite these improvements, 5-year-olds continue to perform below the level of school-age children, adolescents, and adults. These skills continue to develop into adolescence.

Regardless of age, we have a limited capacity for attention and the division of attention is confined to that limitation. Our ability to effectively multitask or alternate attention is dependent on the automaticity or complexity of the task, but are also influenced by conditions like anxiety, arousal, task difficulty, and skills (Sternberg & Sternberg, 2012). Research shows that when dividing attention, people are more apt to make mistakes or perform their tasks more slowly (Matlin, 2013). Attention must be divided among all of the component tasks to perform them.

Classical research on divided attention involved people performing simultaneous tasks, like reading stories while listening and writing something else, or listening to two separate messages through different ears. Subjects were often tested on their ability to learn new information while engaged in multiple tasks. More current research examines the performance of doing two tasks simultaneously (Matlin, 2013), such as driving while performing another task. This research reveals that the human attentional system has limits for what it can process. For examples, driving performance is worse while engaged in other tasks; drivers make more mistakes, brake harder and later, get into more accidents, veer into other lanes, and/or are less aware of their surroundings when engaged in the previously discussed tasks (Collet et al., 2009; Salvucci & Taatgen, 2008; Strayer & Drews, 2007).

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Video 3. *The Spotlight Model of Attention and Our Ability to Multitask* explains how we divide our attention to attend to different tasks or information.

Memory

Memory is central to cognitive development. Our memories form the basis for our sense of self, guide our thoughts and decisions, influence our emotional reactions, and allow us to learn (Bauer, 2008)[1].

It is thought that Piaget underestimated memory ability in infants (Schneider, 2015)[2].

1. Bauer PJ, Pathman T. Memory and Early Brain Development. In: Tremblay RE, Boivin M, Peters RDeV, eds. Paus T, topic ed. Encyclopedia on Early Childhood Development [online]. http://www.child-encyclopedia.com/brain/according-experts/memory-and-early-brain-development. Published December 2008. Accessed March 2, 2019.
2. Schneider, Wolfgang. (2015). This belief came in part from findings that adults rarely recall personal events from before the age of 3

As mentioned when discussing the development of infant senses, within the first few weeks of birth, infants recognize their caregivers by face, voice, and smell. Sensory and caregiver memories are apparent in the first month, motor memories by 3 months, and then, at about 9 months, more complex memories including language (Mullally & Maguire, 2014)[3]. There is agreement that memory is fragile in the first months of life, but that improves with age. Repeated sensations and brain maturation are required in order to process and recall events (Bauer, 2008). Infants remember things that happened weeks and months ago (Mullally & Maguire, 2014), although they most likely will not remember it decades later. From the cognitive perspective, this has been explained by the idea that the lack of linguistic skills of babies and toddlers limit their ability to mentally represent events; thereby, reducing their ability to encode memory. Moreover, even if infants do form such early memories, older children and adults may not be able to access them because they may be employing very different, more linguistically based, retrieval cues than infants used when forming the memory.

years (a phenomenon known as **infantile** or **childhood amnesia**). However, research with infants and young children has made it clear that they can and do form memories of events. Memory development from early childhood through emerging adulthood. Switzerland: Spring International. doi: 10.1007/978-3-319-09611-7.

3. Mullally, Sinead L. & Maguire, Eleanor. A. (2014). Learning to remember: The early ontogeny of episodic memory. Developmental Cognitive Neuroscience, 9(13), 12-29. doi: 10.1016/j.dcn.2013.12.006

Watch It

Watch this Ted talk from Alison Gopnik to hear about more research done on cognition in babies.

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Memory is an information processing system; therefore, we often compare it to a computer. **Memory** is the set of processes used to encode, store, and retrieve information over different periods of time.

Figure 1. Encoding involves the input of information into the memory system. Storage is the retention of encoded information.

Retrieval, or getting the information out of memory and back into awareness, is the third function.

Encoding

We get information into our brains through a process called **encoding**, which is the input of information into the memory system. Once we receive sensory information from the environment, our brains label or code it. We organize the information with other similar information and connect new concepts to existing concepts. Encoding information occurs through automatic processing and effortful processing.

If someone asks you what you ate for lunch today, more than likely, you could recall this information quite easily. This is known as **automatic processing**, or the encoding of details like time, space, frequency, and the meaning of words. Automatic processing is usually done without any conscious awareness. Recalling the last time you studied for a test is another example of automatic processing. But what about the actual test material you studied? It probably required a lot of work and attention on your part in order to encode that information. This is known as **effortful processing**.

There are three types of encoding. The encoding of words and their meaning is known as **semantic encoding**. It was first demonstrated by William Bousfield (1935) in an experiment in which he asked people to memorize words. The 60 words were actually divided into 4 categories of meaning, although the participants did not know this because the words were randomly presented. When they were asked to remember the words, they tended to recall them in categories, showing that they paid attention to the meanings of the words as they learned them.

Visual encoding is the encoding of images, and **acoustic encoding** is the encoding of sounds, words in particular. To see how visual encoding works, read over this list of words: *car*, *level*,

dog, *truth*, *book*, *value*. If you were asked later to recall the words from this list, which ones do you think you'd most likely remember? You would probably have an easier time recalling the words *car*, *dog*, and *book*, and a more difficult time recalling the words *level*, *truth*, and *value*. Why is this? Because you can recall images (mental pictures) more easily than words alone. When you read the words *car*, *dog*, and *book*, you created images of these things in your mind. These are concrete, high-imagery words. On the other hand, abstract words like *level*, *truth*, and *value* are low-imagery words. High-imagery words are encoded both visually and semantically (Paivio, 1986), thus building a stronger memory.

Now let's turn our attention to acoustic encoding. You are driving in your car, and a song comes on the radio that you haven't heard in at least 10 years, but you sing along, recalling every word. In the United States, children often learn the alphabet through song, and they learn the number of days in each month through rhyme: "Thirty days hath September, / April, June, and November; / All the rest have thirty-one, / Save February, with twenty-eight days clear, / And twenty-nine each leap year." These lessons are easy to remember because of acoustic encoding. We encode the sounds the words make. This is one of the reasons why much of what we teach young children is done through song, rhyme, and rhythm.

Which of the three types of encoding do you think would give you the best memory of verbal information? Some years ago, psychologists Fergus Craik and Endel Tulving (1975) conducted a series of experiments to find out. Participants were given words along with questions about them. The questions required the participants to process the words at one of the three levels. The visual processing questions included such things as asking the participants about the font of the letters. The acoustic processing questions asked the participants about the sound or rhyming of the words, and the semantic processing questions asked the participants about the meaning of the words. After participants

were presented with the words and questions, they were given an unexpected recall or recognition task.

Words that had been encoded semantically were better remembered than those encoded visually or acoustically. Semantic encoding involves a deeper level of processing than shallower visual or acoustic encoding. Craik and Tulving concluded that we process verbal information best through semantic encoding, especially if we apply what is called the self-reference effect. The **self-reference effect** is the tendency for an individual to have a better memory for information that relates to oneself in comparison to material that has less personal relevance (Rogers, Kuiper & Kirker, 1977). Could semantic encoding be beneficial to you as you attempt to memorize the concepts in this chapter?

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Video 4. *Encoding Strategies* discusses various encoding techniques that help us store information in memory.

Storage

Once the information has been encoded, we have to somehow retain it. Our brains take the encoded information and place it in storage. **Storage** is the creation of a permanent record of information.

In order for a memory to go into storage (i.e., long-term memory),

it has to pass through three distinct stages: Sensory Memory, Short-Term Memory, and finally, Long-Term Memory. These stages were first proposed by Richard Atkinson and Richard Shiffrin (1968). Their model of human memory (Figure 6.5.2), called Atkinson-Shiffrin (A-S) or three-box model, is based on the belief that we process memories in the same way that a computer processes information.

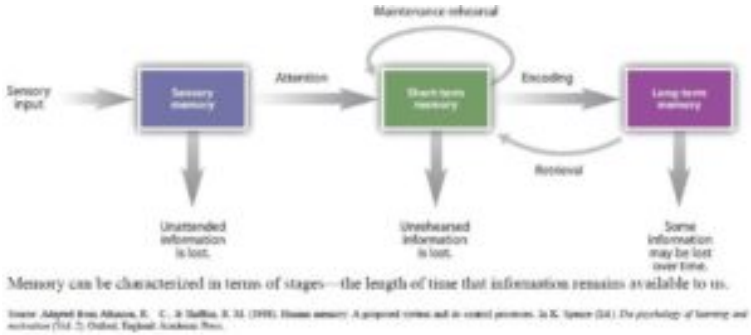

Figure 2. According to the Atkinson-Shiffrin model of memory, information passes through three distinct stages in order for it to be stored in long-term memory.

But three-box is just one model of memory. Others, such as Baddeley and Hitch (1974), have proposed a model where short-term memory itself has different forms. In this model, storing memories in short-term memory is like opening different files on a computer and adding information. The type of short-term memory (or computer file) depends on the type of information received. There are memories in visual-spatial form, as well as memories of spoken or written material, and they are stored in three short-term systems: a visuospatial sketchpad, an episodic buffer, and a phonological loop. According to Baddeley and Hitch, a central executive part of memory supervises or controls the flow of information to and from the three short-term systems.

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Video 5. *Information Processing Model: Sensory, Working, and Long Term Memory* explains the three-box model of memory.

Sensory Memory

In the Atkinson-Shiffrin model, stimuli from the environment are processed first in **sensory memory**: storage of brief sensory events, such as sights, sounds, and tastes. It is very brief storage, *essentially long enough for the brain to register and start processing the information*. Sensory memory can hold visual information for about half of a second and auditory information for a few seconds. Unlike other cognitive processes, it seems that sensory memory does not change from infancy (Siegler, 1998), but without the ability to encode the information, it fades from sensory memory quickly (Papalia et al., 2008). As children and adolescence become more capable of encoding, they can take more advantage of the information available to them in the sensory memory.

We are constantly bombarded with sensory information. We cannot absorb all of it, or even most of it. And most of it has no impact on our lives. For example, what was your professor wearing the last class period? As long as the professor was dressed appropriately, it does not really matter what she was wearing. Sensory information about sights, sounds, smells, and even textures, which we do not view as valuable information, we discard.

If we view something as valuable, the information will move into our short-term memory system.

One study of sensory memory researched the significance of valuable information on short-term memory storage. J. R. Stroop discovered a memory phenomenon in the 1930s: you will name a color more easily if it appears printed in that color, which is called the Stroop effect. In other words, the word "red" will be named more quickly, regardless of the color the word appears in, than any word that is colored red. Try an experiment: name the colors of the words you are given in Figure 6.5.3 Do not read the words, but say the color the word is printed in. For example, upon seeing the word "yellow" in green print, you should say "green," not "yellow." This experiment is fun, but it's not as easy as it seems.

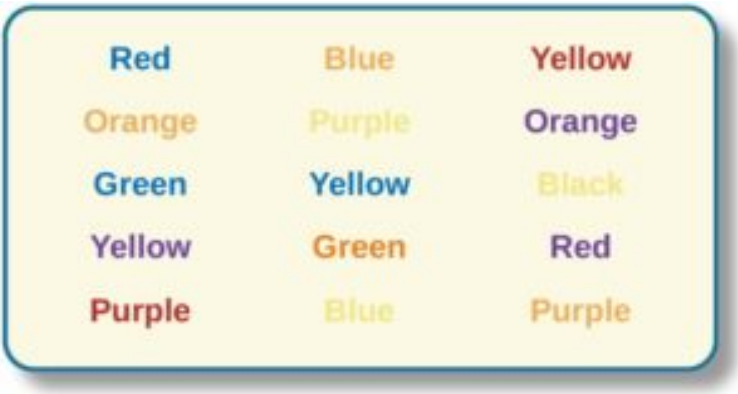

Figure 3. The Stroop effect describes why it is difficult for us to name a color when the word and the color of the word are different.

Short-Term (Working) Memory

Short-term memory (STM), also called **working memory**, is a temporary storage system that processes incoming sensory memory. Short-term memory is the bridge between information taken in through sensory memory and the more permanent storage of information in long-term memory. Information that is not moved along from short-term memory to long-term memory will be forgotten. Short-term memory is also called working memory because this is the system where the "work" of memory happens. If you are retrieving information from your long-term memory, you are moving it into your working memory, where you can think about that information.

Think of working memory as the information you have displayed on your computer screen—a document, a spreadsheet, or a web page. Then, the information in this memory system goes to long-term memory (you save it to your hard drive), or it is discarded (you delete a document or close a web browser). This step of **rehearsal**, the conscious repetition of information to be remembered, to move STM into long-term memory is called **memory consolidation**.

You may find yourself asking, "How much information can our memory handle at once?" To explore the capacity and duration of your short-term memory, have a partner read the strings of random numbers (Figure 6.5.4) out loud to you, beginning each string by saying, "Ready?" and ending each by saying, "Recall," at which point you should try to write down the string of numbers from memory.

9754	68259	913825	5316842	86951372	719384273
6419	67148	648327	5963827	51739826	163875942

Figure 4. Work through this series of numbers using the recall

exercise explained above to determine the longest string of digits that you can store.

Note the longest string at which you got the series correct. For most people, this will be close to 7. Recall is somewhat better for random numbers than for random letters (Jacobs, 1887), and also often slightly better for information we hear (acoustic encoding) rather than see (visual encoding) (Anderson, 1969).

Short-term or working memory often requires conscious effort and adequate use of attention to function effectively. As you read earlier, children struggle with many aspects of attention, and this greatly diminishes their ability to consciously juggle several pieces of information in memory. The capacity of working memory, that is the amount of information someone can hold in consciousness, is smaller in young children than in older children and adults. The typical 5-year-old can hold only a 4 digit number active. The typical adult and teenager can hold a 7 digit number active in their short-term memory. The capacity of working memory expands during middle and late childhood, and research has suggested that both an increase in processing speed and the ability to inhibit irrelevant information from entering memory are contributing to the greater efficiency of working memory during this age (de Ribaupierre, 2002). Changes in myelination and synaptic pruning in the cortex are likely behind the increase in processing speed and ability to filter out irrelevant stimuli (Kail, McBride-chang, Ferrer, Cho, & Shu, 2013).

Short-term memory can only hold information for a short period of time, without rehearsal. For a typical adolescent or adult, storage lasts about 20-30 seconds. Older children and adults use mental strategies to aid their memory performance. For instance, simple rote rehearsal may be used to commit information to memory. Young children often do not rehearse unless reminded to do so, and when they do rehearse, they often fail to use clustering rehearsal. In **clustering rehearsal,** *the person rehearses previous material while adding in additional information.* If a list of words is read out loud to you, you are likely to rehearse each word as you hear it along

with any previous words you were given. Young children will repeat each word they hear, but often fail to repeat the prior words in the list. In Schneider, Kron-Sperl, and Hunnerkopf's (2009) longitudinal study of 102 kindergarten children, the majority of children used no strategy to remember information, a finding that was consistent with previous research. As a result, their memory performance was poor when compared to their abilities as they aged and started to use more effective memory strategies.

Executive Functions

Changes in attention and the working memory system also involve changes in executive function. **Executive function (ef)** *refers to self-regulatory processes*, such as the ability to inhibit behavior or cognitive flexibility, *that enable adaptive responses to new situations or to reach a specific goal.* Executive function skills gradually emerge during early childhood and continue to develop throughout childhood and adolescence. Like many cognitive changes, brain maturation, especially the prefrontal cortex, along with experience, influence the development of executive function skills. A child, whose parents are more warm and responsive, use scaffolding when the child is trying to solve a problem, and who provide cognitively stimulating environments for the child show higher executive function skills (Fay-Stammbach, Hawes & Meredith, 2014). For instance, scaffolding was positively correlated with greater cognitive flexibility at age two and inhibitory control at age four (Bibok, Carpendale & Müller, 2009).

STM and Learning

Individuals differ in their memory abilities, and these differences predict academic performance (Prebler, Krajewski, & Hasselhorn,

2013). Children with learning disabilities in math and reading often have difficulties with working memory (Alloway, 2009). They may struggle with following the directions of an assignment. When a task calls for multiple steps, children with poor working memory may miss steps because they may lose track of where they are in the task. Adults working with such children may need to communicate: using more familiar vocabulary, using shorter sentences, repeating task instructions more frequently, and breaking more complex tasks into smaller, more manageable steps. Some studies have also shown that more intensive training of working memory strategies, such as chunking, aid in improving the capacity of working memory in children with poor working memory (Alloway, Bibile, & Lau, 2013).

Long-term Memory

Long-term memory (LTM) is the continuous storage of information. Unlike short-term memory, the storage capacity of LTM has no real limits. It encompasses all the things you can remember what happened more than just a few minutes ago to all of the things that you can remember what happened days, weeks, and years ago. In keeping with the computer analogy, the information in your LTM would be like the information you have saved on the hard drive. It isn't there on your desktop (your short-term memory), but you can pull up this information when you want it, at least most of the time. Not all long-term memories are strong memories. Some memories can only be recalled through prompts. For example, you might easily recall a fact— "What is the capital of the United States?"—or a procedure—"How do you ride a bike?"—but you might struggle to recall the name of the restaurant you had dinner when you were on vacation in France last summer. A prompt, such as that the restaurant was named after its owner, who spoke to you about your shared interest in soccer, may help you recall the name of the restaurant.

Long-term memory is divided into two types: explicit and implicit (Figure 6.5.5). Understanding the different types is important because a person's age or particular types of brain trauma or disorders can leave certain types of LTM intact while having disastrous consequences for other types. **Explicit memories,** also called **declarative memories,** are those we consciously try to remember and recall. For example, if you are studying for your chemistry exam, the material you are learning will be part of your explicit memory. (Note: Sometimes, but not always, the terms explicit memory and declarative memory are used interchangeably.)

Implicit memories, also called **non-declarative memories,** are memories that are not part of our consciousness. They are memories formed from behaviors. Implicit memory is also called non-declarative memory.

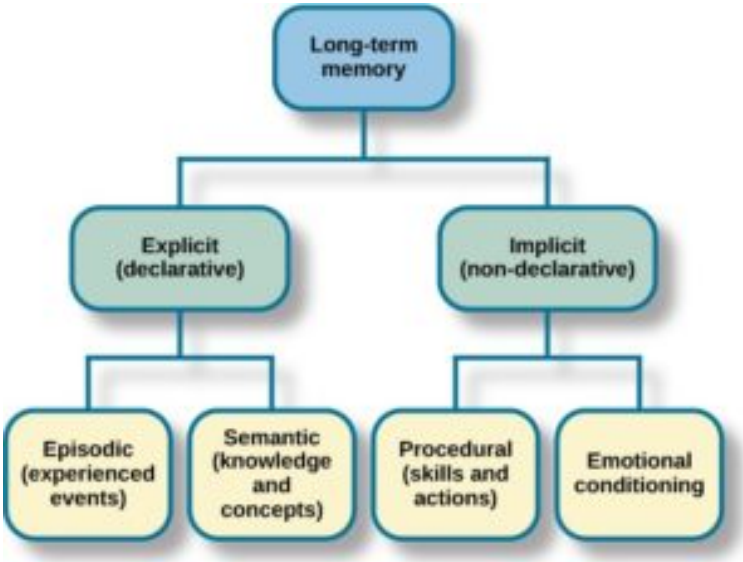

Figure 5. There are two components of long-term memory: explicit and implicit. Explicit memory includes episodic and

semantic memory. Implicit memory includes procedural memory and things learned through conditioning.

Procedural memory is a type of implicit memory: it stores information about how to do things. It is the memory for skilled actions, such as how to brush your teeth, how to drive a car, how to swim the crawl (freestyle) stroke. If you are learning how to swim freestyle, you practice the stroke: how to move your arms, how to turn your head to alternate breathing from side to side, and how to kick your legs. You would practice this many times until you become good at it. Once you learn how to swim freestyle and your body knows how to move through the water, you will never forget how to swim freestyle, even if you do not swim for a couple of decades. Similarly, if you present an accomplished guitarist with a guitar, even if he has not played in a long time, he will still be able to play quite well.

Explicit or declarative memory has to do with the storage of facts and events we personally experienced. Explicit (declarative) memory has two parts: semantic memory and episodic memory. Semantic means having to do with language and knowledge about language. An example would be the question, "what does *argumentative* mean?" Stored in our **semantic memory** is knowledge about words, concepts, and language-based knowledge and facts. For example, answers to the following questions are stored in your semantic memory:

- Who was the first President of the United States?
- What is democracy?
- What is the longest river in the world?

Episodic memory is information about events we have personally experienced. The concept of episodic memory was first proposed about 40 years ago (Tulving, 1972). Since then, Tulving and others have looked at the scientific evidence and reformulated the theory. Currently, scientists believe that episodic memory is memory about happenings in particular places at particular times, the what, where,

and when of an event (Tulving, 2002). It involves recollection of visual imagery as well as the feeling of familiarity (Hassabis & Maguire, 2007).

A component of episodic memory is **autobiographical memory,** or our personal narrative. Adolescents and adults rarely remember events from the first few years of life. We refer to the normal experience as infantile amnesia. In other words, we lack autobiographical memories from our experiences as an infant, toddler, and very young preschooler. Several factors contribute to the emergence of autobiographical memory, including brain maturation, improvements in language, opportunities to talk about experiences with parents and others, the development of the theory of mind, and a representation of "self" (Nelson & Fivush, 2004). Two-year-olds do remember fragments of personal experiences, but these are rarely coherent accounts of past events (Nelson & Ross, 1980). Between 2 and 2 ½ years of age, children can provide more information about past experiences. However, these recollections require considerable prodding by adults (Nelson & Fivush, 2004). Over the next few years, children will form more detailed autobiographical memories and engage in more reflection of the past.

Retrieval

So you have worked hard to encode (via effortful processing) and store some important information for your upcoming final exam. How do you get that information back out of storage when you need it? The act of getting information out of memory storage and back into conscious awareness is known as **retrieval**. This would be similar to finding and opening a paper you had previously saved on your computer's hard drive. Now it's back on your desktop, and you can work with it again. Our ability to retrieve information from long-term memory is vital to our everyday functioning. You must be

able to retrieve information from memory in order to do everything from knowing how to brush your hair and teeth, to driving to work, to knowing how to perform your job once you get there.

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> https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=91#oembed-7

Video 6. *Retrieval Cues* discusses how cues prompt memory retrieval.

There are three ways you can retrieve information out of your long-term memory storage system: recall, recognition, and relearning. **Recall** is what we most often think about when we talk about memory retrieval: it means you can access information without cues. For example, you would use recall for an essay test. **Recognition** happens when you identify information that you have previously learned after encountering it again. It involves a process of comparison. When you take a multiple-choice test, you are relying on recognition to help you choose the correct answer. Here is another example. Let's say you graduated from high school 10 years ago, and you have returned to your hometown for your 10-year reunion. You may not be able to recall all of your classmates, but you recognize many of them based on their yearbook photos.

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Video 7. *Free Recall, Cued Recall, and Recognition* discusses the various ways in which information can be retrieved from long term memory.

The third form of retrieval is **relearning**, and it's just what it sounds like. It involves learning information that you previously learned. Whitney took Spanish in high school, but after high school she did not have the opportunity to speak Spanish. Whitney is now 31, and her company has offered her an opportunity to work in their Mexico City office. In order to prepare herself, she enrolls in a Spanish course at the local community center. She's surprised at how quickly she's able to pick up the language after not speaking it for 13 years; this is an example of relearning.

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Organization of Thinking

During middle childhood and adolescence, young people are able to learn and remember more due to improvements in the way they

attend to and store information. As people learn more about the world, they develop more categories for concepts and learn more efficient strategies for storing and retrieving information. One significant reason is that they continue to have more experiences on which to tie new information. In other words, their **knowledge base**, knowledge in particular areas that makes learning new information easier, expands (Berger, 2014).

Cognitive Control

As noted earlier, executive functions, such as attention, increases in working memory, and cognitive flexibility, have been steadily improving since early childhood. Studies have found that executive function is very competent in adolescence. However, **self-regulation**, or *the ability to control impulses*, may still fail. A failure in self-regulation is especially true when there is high stress or high demand on mental functions (Luciano & Collins, 2012). While high stress or demand may tax even an adult's self-regulatory abilities, neurological changes in the adolescent brain may make teens particularly prone to more risky decision-making under these conditions.

Inductive and Deductive Reasoning

Inductive reasoning emerges in childhood and is a type of reasoning that is sometimes characterized as "bottom-up-processing" in which *specific observations, or specific comments from those in authority, may be used to draw general conclusions*. However, in inductive reasoning, the veracity of the information that created the general conclusion does not guarantee the accuracy of that conclusion. For instance, a child who has only

observed thunder on summer days may conclude that it only thunders in the summer. In contrast, **deductive reasoning**, sometimes called "top-down processing," emerges in adolescence. This type of reasoning starts with some overarching principle, and based on this, proposes specific conclusions. Deductive reasoning guarantees a truthful conclusion if the premises on which it is based are accurate.

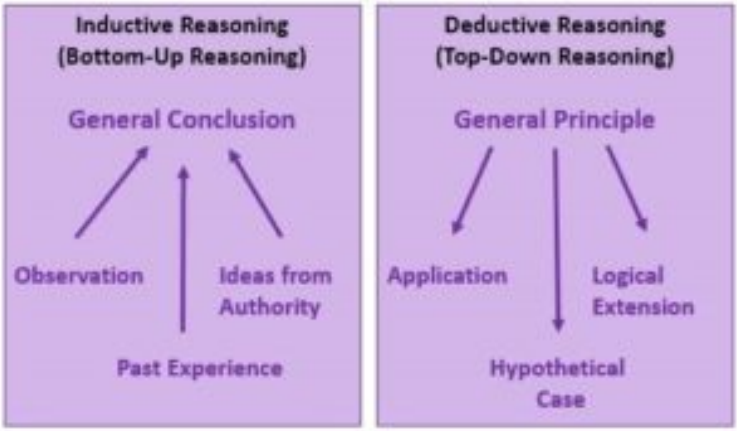

Figure 6. Models of inductive and deductive reasoning.

Intuitive versus Analytic Thinking

Cognitive psychologists often refer to intuitive and analytic thought as the Dual-Process Model, the notion that humans have two distinct networks for processing information (Albert & Steinberg, 2011). **Intuitive thought** is automatic, unconscious, and fast (Kahneman, 2011), and it is more experiential and emotional. In contrast, **Analytic thought** is deliberate, conscious, and rational. While these systems interact, they are distinct (Kuhn, 2013).

Intuitive thought is easier and more commonly used in everyday life. It is also more commonly used by children and teens than by adults (Klaczynski, 2001). The quickness of adolescent thought, along with the maturation of the limbic system, may make teens more prone to emotional, intuitive thinking than adults.

Critical Thinking

According to Bruning et al. (2004), there is a debate in U.S. education as to whether schools should teach students what to think or how to think. **Critical thinking**, or a detailed examination of beliefs, courses of action, and evidence, involves teaching children how to think. The purpose of critical thinking is to evaluate information in ways that help us make informed decisions. Critical thinking involves better understanding a problem through gathering, evaluating, and selecting information, and also by considering many possible solutions. Ennis (1987) identified several skills useful in critical thinking. These include: Analyzing arguments, clarifying information, judging the credibility of a source, making value judgments, and deciding on an action. Metacognition is essential to critical thinking because it allows us to reflect on the information as we make decisions.

Metacognition

As children mature through middle and late childhood and into adolescence, they have a better understanding of how well they are performing a task and the level of difficulty of a task. As they become more realistic about their abilities, they can adapt studying strategies to meet those needs. Young children spend as much time on an unimportant aspect of a problem as they do on the main point,

while older children start to learn to prioritize and gauge what is significant and what is not. As a result, they develop metacognition. **Metacognition** refers to the knowledge we have about our own thinking and our ability to use this awareness to regulate our own cognitive processes (Bruning, Schraw, Norby, & Ronning, 2004).

Bjorklund (2005) describes a developmental progression in the acquisition and use of memory strategies. Such strategies are often lacking in younger children but increase in frequency as children progress through elementary school. Examples of memory strategies include rehearsing information you wish to recall, visualizing and organizing information, creating rhymes, such as "i" before "e" except after "c," or inventing acronyms, such as "ROYGBIV" to remember the colors of the rainbow. Schneider, Kron-Sperl, and hünnerkopf (2009) reported a steady increase in the use of memory strategies from ages six to ten in their longitudinal study (see table 6.5.7). Moreover, by age ten, many children were using two or more memory strategies to help them recall information. Schneider and colleagues found that there were considerable individual differences at each age in the use of strategies and that children who utilized more strategies had better memory performance than their same-aged peers.

Age	Percentage
6	55
7	44
8	25
9	17
10	13

Table 7. Percentage of children who did not use any memory strategies by age.

A person may experience three deficiencies in their use of memory strategies. A **mediation deficiency** *occurs when a person does not grasp the strategy being taught, and thus, does not benefit*

from its use. If you do not understand why using an acronym might be helpful, or how to create an acronym, the strategy is not likely to help you. In a **production deficiency,** the person does not spontaneously use a memory strategy and has to be prompted to do so. In this case, the person knows the strategy and is more than capable of using it, but they fail to "produce" the strategy on their own. For example, a child might know how to make a list but may fail to do this to help them remember what to bring on a family vacation. A **utilization deficiency** refers to a person using an appropriate strategy, but it fails to aid their performance. Utilization deficiency is common in the early stages of learning a new memory strategy (Schneider & Pressley, 1997; miller, 2000). Until the use of the strategy becomes automatic, it may slow down the learning process, as space is taken up in memory by the strategy itself. Initially, children may get frustrated because their memory performance may seem worse when they try to use the new strategy. Once children become more adept at using the strategy, their memory performance will improve. Sodian and Schneider (1999) found that new memory strategies acquired prior to age eight often show utilization deficiencies, with there being a gradual improvement in the child's use of the strategy. In contrast, strategies acquired after this age often followed an "all-or-nothing" principle in which improvement was not gradual, but abrupt.

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Language Development

Language is a system of communication that uses symbols in a regular way to create meaning. Language gives us the ability to communicate our intelligence to others by talking, reading, and writing. Although other species have at least some ability to communicate, none of them have language.

If you've ever tried to learn a new language, you know it's not easy. There are new rules of grammar that come with many exceptions, new sounds that are hard to make, endless lists of vocabulary to commit to memory and so on. And yet, you managed to learn the basics of your very first language around the time you were two years old; no textbooks in sight.

Not only are children able to absorb the complicated rules of grammar without formal teaching, they do so from a limited vocabulary. Regardless of how much a child is spoken to, they will not hear every possible word and sentence by the time they begin speaking. Yet when they do start to talk, children begin to follow grammatical rules and apply them to form new, innovative phrases. This level of information processing is incredibly impressive in anyone, much less someone still figuring out counting and skipping!

Given the remarkable complexity of a language, one might expect that mastering a language would be an especially arduous task; indeed, for those of us trying to learn a second language as adults, this might seem to be true. However, young children master language very quickly with relative ease. B. F. Skinner (1957) proposed that language is learned through reinforcement. Noam Chomsky (1965) criticized this behaviorist approach, asserting instead that the mechanisms underlying language acquisition are biologically determined. The use of language develops in the absence of formal instruction and appears to follow a very similar pattern in children from vastly different cultures and backgrounds.

It would seem, therefore, that we are born with a biological predisposition to acquire a language (Chomsky, 1965; Fernández & Cairns, 2011). Moreover, it appears that there is a critical period for language acquisition, such that this proficiency at acquiring language is maximal early in life; generally, as people age, the ease with which they acquire and master new languages diminishes (Johnson & Newport, 1989; Lenneberg, 1967; Singleton, 1995).

There are many components of language that will now be reviewed.

The Structures of Language

All languages have underlying structural rules that make meaningful communication possible. Every language is different. In English, an adjective comes before a noun ("red house"), whereas in Spanish, the adjective comes after ("casa [house] roja [red]."') In German, you can put noun after noun together to form giant compound words; in Chinese, the pitch of your voice determines the meaning of your words; in American Sign Language, you can convey full, grammatical sentences with tense and aspect by moving your hands and face. But all languages have structural underpinnings that make them logical for the people who speak and understand them.

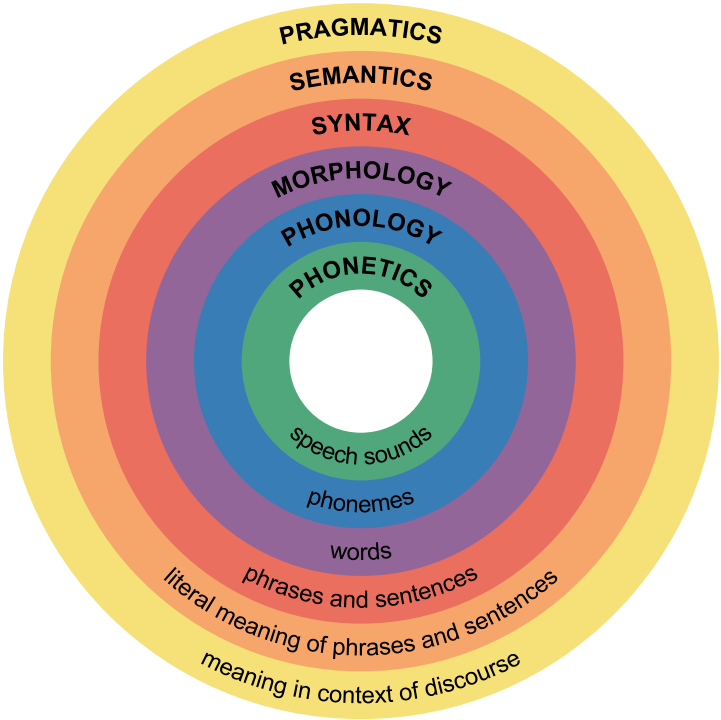

Figure 1. Major levels of linguistic structure. This diagram outlines the relationship between types of linguistic units. Speech sounds make up phonemes, which make up words. Words make up sentences, which have literal meanings and contextual meanings.

Phoneme

A **phoneme** is *the smallest unit of sound that makes a meaningful difference in a language*. This small sound may cause a change of meaning within a language, but that doesn't have meaning by itself. For example, in the words "bake" and "brake," only one phoneme

has been altered, but a change in meaning has been triggered. The phoneme /r/ has no meaning on its own, but by appearing in the word it has completely changed the word's meaning. In spoken languages, phonemes are produced by the positions and movements of the vocal tract, including our lips, teeth, tongue, vocal cords, and throat, whereas in sign languages phonemes are defined by the shapes and movement of the hands.

Phonemes correspond to the sounds of the alphabet, although there is not always a one-to-one relationship between a letter and a phoneme (the sound made when you say the word). For example, the word "dog" has three phonemes: /d/, /o/, and / g /. However, the word "shape," despite having five letters, has only three phonemes: /sh/, /long-a/, and /p/. There are hundreds of unique phonemes that can be made by human speakers, but most languages only use a small subset of the possibilities. English contains about 45 phonemes, whereas other languages have as few as 15 and others more than 60. The Hawaiian language contains fewer phonemes as it includes only 5 vowels (a, e, i, o, and u) and 7 consonants (h, k, l, m, n, p, and w).

Babies can discriminate among the sounds that make up a language (for example, they can tell the difference between the "s" in vision and the "ss" in fission); early on, they can differentiate between the sounds of all human languages, even those that do not occur in the languages that are used in their environment. However, they lose their ability to do so as they get older; by 10 months of age, they can only discriminate among those phonemes that are used in the language or languages in their environments (Jensen, 2011; Werker & Lalonde, 1988; Werker & Tees, 1984). Phonemes that were initially differentiated come to be treated as equivalent (Werker & Tees, 2002).

Morpheme

Whereas phonemes are the smallest units of sound in language, a **morpheme** is *a string of one or more phonemes that makes up the smallest units of meaning in a language*. Thus, a morpheme is a series of phonemes that has a special meaning. If a morpheme is altered in any way, the entire meaning of the word can be changed. Some morphemes are individual words (such as "eat" or "water"). These are known as free morphemes because they can exist on their own. Other morphemes are prefixes, suffixes, or other linguistic pieces that aren't full words on their own but do affect meaning (such as the "-s" at the end of "cats" or the "re-" at the beginning of "redo.") Because these morphemes must be attached to another word to have meaning, they are called bound morphemes.

Semantics

Semantics refers to *the set of rules we use to obtain meaning from morphemes*. For example, adding "ed" to the end of a verb makes it past tense.

Grammar and Syntax

Because all language obeys a set of combinatory rules, we can communicate an infinite number of concepts. While every language has a different set of rules, all languages do obey rules. These rules are known as grammar. Speakers of a language have internalized the rules and exceptions for that language's grammar. There are rules for every level of language—word formation (for example, native speakers of English have internalized the general rule that -ed is the ending for past-tense verbs, so even when they encounter a brand-

new verb, they automatically know how to put it into past tense); phrase formation (for example, knowing that when you use the verb "buy," it needs a subject and an object; "She buys" is wrong, but "She buys a gift" is okay); and sentence formation.

Syntax is *the set of rules of a language by which we construct sentences*. Each language has a different syntax. The syntax of the English language requires that each sentence have a noun and a verb, each of which may be modified by adjectives and adverbs. Some syntaxes make use of the order in which words appear. For example, in English "The man bites the dog" is different from "The dog bites the man."

Pragmatics

The social side of language is expressed through **pragmatics**, or *how we communicate effectively and appropriately with others*. Examples of pragmatics include turn- taking, staying on topic, volume and tone of voice, and appropriate eye contact. Lastly, words do not possess fixed meanings but change their interpretation as a function of the context in which they are spoken. We use **contextual information**, *the information surrounding language*, to help us interpret it. Examples of contextual information include our knowledge and nonverbal expressions such as facial expressions, postures, and gestures. Misunderstandings can easily arise if people are not attentive to contextual information or if some of it is missing, such as it may be in newspaper headlines or in text messages.

Pre-Linguistic Pragmatics

Video 1. *Talking Twin Babies* demonstrates how children can learn and use pragmatics even before they can produce language.

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Language Development Progression

Children begin to learn about language from a very early age (Table 1). In fact, it appears that this is occurring even before we are born. Newborns show a preference for their mother's voice and appear to be able to discriminate between the language spoken by their mother and other languages. Babies are also attuned to the languages being used around them and show preferences for videos of faces that are moving in synchrony with the audio of spoken language versus videos that do not synchronize with the audio (Blossom &

Morgan, 2006; Pickens, 1994; Spelke & Cortelyou, 1981).

Table 1. Stages of Language and Communication Development

Stage	Age	Developmental Language and Communication
1	0–3 months	Reflexive communication
2	3–8 months	Reflexive communication; interest in others
3	8–12 months	Intentional communication; sociability
4	12–18 months	First words
5	18–24 months	Simple sentences of two words
6	2–3 years	Sentences of three or more words
7	3–5 years	Complex sentences; has conversations

Intentional Vocalizations

In terms of producing spoken language, babies begin to coo almost immediately. **Cooing** *is a one-syllable combination of a consonant and a vowel sound* (e.g., coo or ba). Interestingly, babies replicate sounds from their own languages. A baby whose parents speak French will coo in a different tone than a baby whose parents speak Spanish or Urdu. These gurgling, musical vocalizations can serve as a source of entertainment to an infant who has been laid down for a nap or seated in a carrier on a car ride. Cooing serves as practice for vocalization, as well as the infant hears the sound of his or her own voice and tries to repeat sounds that are entertaining. Infants also begin to learn the pace and pause of conversation as they alternate their vocalization with that of someone else and then take their turn again when the other person's vocalization has stopped.

At about four to six months of age, infants begin making even more elaborate vocalizations that include the sounds required for any language. Guttural sounds, clicks, consonants, and vowel sounds stand ready to equip the child with the ability to repeat whatever sounds are characteristic of the language heard.

Eventually, these sounds will no longer be used as the infant grows more accustomed to a particular language.

At about 7 months, infants begin **Babbling**, engaging in *intentional vocalizations that lack specific meaning and comprise a consonant-vowel repeated sequence, such as ma-ma-ma, da-da-da.* Children babble as practice in creating specific sounds, and by the time they are 1 year old, the babbling uses primarily the sounds of the language that they are learning (de Boysson- Bardies, Sagart, & Durand, 1984). These vocalizations have a conversational tone that sounds meaningful even though it isn't. Babbling also helps children understand the social, communicative function of language. Children who are exposed to sign language babble in sign by making hand movements that represent real language (Petitto & Marentette, 1991).

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Gesturing

Children communicate information through gesturing long before they speak, and there is some evidence that gesture usage predicts subsequent language development (Iverson & Goldin-Meadow, 2005). Deaf babies also use gestures to communicate wants, reactions, and feelings. Because gesturing seems to be easier than vocalization for some toddlers, sign language is sometimes taught to enhance one's ability to communicate by making use of the ease

of gesturing. The rhythm and pattern of language is used when deaf babies sign just as it is when hearing babies babble.

Examples

Video 2. *Baby Sign Language* demonstrates how infants can be taught sign language to communicate before they can speak. Most infants will begin gesturing on their own around 10 months old, but infants can be taught gestures, like signs, before they are 6 months old.

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Receptive Language

At around ten months of age, the infant *can understand more than he or she can say, which is referred to as* **receptive language**. You may have experienced this phenomenon as well if you have ever tried to learn a second language. You may have been able to follow a conversation more easily than contribute to it. One of the first words that children understand is their own name, usually by about

6 months, followed by commonly used words like "bottle," "mama," and "doggie" by 10 to 12 months (Mandel, Jusczyk, & Pisoni, 1995).

Infants shake their head "no" around 6–9 months, and they respond to verbal requests to do things like "wave bye-bye" or "blow a kiss" around 9–12 months. Children also use contextual information, particularly the cues that parents provide, to help them learn language. Children learn that people are usually referring to things that they are looking at when they are speaking (Baldwin, 1993), and that that the speaker's emotional expressions are related to the content of their speech.

Productive Language

Children begin using their first words at about 12 or 13 months of age and may use partial words to convey thoughts at even younger ages. *These one word expressions are referred to as* **holophrasic speech.** For example, the child may say "ju" for the word "juice" and use this sound when referring to a bottle. The listener must interpret the meaning of the holophrase, and when this is someone who has spent time with the child, interpretation is not too difficult. But, someone who has not been around the child will have trouble knowing what is meant. Imagine the parent who to a friend exclaims, "Ezra's talking all the time now!" The friend hears only "ju da ga" to which the parent explains means, "I want some milk when I go with Daddy."

First words and Cultural Influences

First words if the child is using English tend to be nouns. The child labels objects such as cup, ball, or other items that they regularly interact with. In a verb-friendly language such as Chinese, however, children may learn more verbs. This may also be due to the different

emphasis given to objects based on culture. Chinese children may be taught to notice action and relationships between objects, while children from the United States may be taught to name an object and its qualities (color, texture, size, etc.). These differences can be seen when comparing interpretations of art by older students from China and the United States.

Two-word Sentences and Telegraphic Speech

By the time they become toddlers, children have a vocabulary of about 50-200 words and begin putting those words together in telegraphic speech, such as "baby bye-bye" or "doggie pretty". Words needed to convey messages are used, but the articles and other parts of speech necessary for grammatical correctness are not yet used. These expressions sound like a telegraph, or perhaps a better analogy today would be that they read like a text message. **Telegraphic Speech/Text Message Speech** *occurs when unnecessary words are not used.* "Give baby ball" is used rather than "Give the baby the ball."

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Language Errors

The early utterances of children contain many errors, for instance,

confusing /b/ and /d/, or /c/ and /z/. The words children create are often simplified, in part because they are not yet able to make more complex sounds of the real language (Dobrich & Scarborough, 1992). Children may say "keekee" for kitty, "nana" for banana, and "vesketti" for spaghetti because it is easier. Often these early words are accompanied by gestures that may also be easier to produce than the words themselves. Children's pronunciations become increasingly accurate between 1 and 3 years, but some problems may persist until school age.

A child who learns that a word stands for an object may initially think that the *word can be used for only that particular object*, which is referred to as **Underextension.** Only the family's Irish Setter is a "doggie", for example. More often, however, a child may think that *a label applies to all objects that are similar to the original object*, which is called **Overextension.** For example, all animals become "doggies".

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Link to Learning

Read this article to learn more about common linguistic mistakes that children make and what they mean: 10 Language Mistakes Kids Make That Are Actually Pretty Smart.

Child-Directed Speech

Why is a horse a "horsie"? Have you ever wondered why adults tend to use "baby talk" or that sing-song type of intonation and exaggeration used when talking to children? This represents a universal tendency and is known as **child-directed Speech.** *It involves exaggerating the vowel and consonant sounds, using a high-pitched voice, and delivering the phrase with great facial expression* (Clark, 2009). Why is this done? Infants are frequently more attuned to the tone of voice of the person speaking than to the content of the words themselves, and are aware of the target of speech. Werker, Pegg, and McLeod (1994) found that infants listened longer to a woman who was speaking to a baby than to a woman who was speaking to another adult. It may be in order to clearly articulate the sounds of a word so that the child can hear the sounds involved. It may also be because when this type of speech is used, the infant pays more attention to the speaker and this sets up a pattern of interaction in which the speaker and listener are in tune with one another.

Watch It

Video 3. This video examines new research on child-directed speech.

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Vocabulary

A child's vocabulary expands between the ages of two to six from about 200 words to over 10,000 words. This "vocabulary spurt" typically involves 10-20 new words per week and is accomplished through a process called **fast-mapping**. *Words are easily learned by making connections between new words and concepts already known.* The parts of speech that are learned depend on the language and what is emphasized. Children speaking verb-friendly languages, such as Chinese and Japanese, learn verbs more readily, while those speaking English tend to learn nouns more readily. However, those learning less verb-friendly languages, such as English, seem to need assistance in grammar to master the use of verbs (Imai et al., 2008).

One of the reasons that children can classify objects in so many ways is that they have acquired a vocabulary to do so. By fifth grade, a child's vocabulary has grown to 40,000 words. It grows at a rate that exceeds that of those in early childhood. This language explosion, however, differs from that of younger children because it is facilitated by being able to associate new words with those already known, and because it is accompanied by a more sophisticated understanding of the meanings of a word.

Children can repeat words and phrases after having heard them

only once or twice, but they do not always understand the meaning of the words or phrases. This is especially true of expressions or figures of speech which are taken literally. For example, a classroom full of preschoolers hears the teacher say, "Wow! That was a piece of cake!" The children began asking "Cake? Where is my cake? I want cake!"

Those in middle and late childhood are also able to think of objects in less literal ways. For example, if asked for the first word that comes to mind when one hears the word "pizza", the younger child is likely to say "eat" or some word that describes what is done with a pizza. However, the older child is more likely to place pizza in the appropriate category and say "food". This sophistication of vocabulary is also evidenced by the fact that older children tell jokes and delight in doing do. They may use jokes that involve plays on words such as "knock- knock" jokes or jokes with punch lines. Young children do not understand play on words and tell "jokes" that are literal or slapstick, such as "A man fell down in the mud! Isn't that funny?"

30 Million Word Gap

To accomplish the tremendous rate of word learning that needs to occur during early childhood, it is important that children are learning new words each day. Research by Betty Hart and Todd Risley in the late 1990s and early 2000s indicated that children from less advantaged backgrounds are exposed to millions of fewer words in their first three years of life than children who come from more privileged socioeconomic backgrounds. In their research, families were classified by socioeconomic status, (SES) into "high" (professional), "middle" (working class), and

"low" (welfare) SES. They found that the average child in a professional family hears 2,153 words per waking hour, the average child in a working-class family hears 1,251 words per hour, and an average child in a welfare family only 616 words per hour. Extrapolating, they stated that, "in four years, an average child in a professional family would accumulate experience with almost 45 million words, an average child in a working-class family 26 million words, and an average child in a welfare family 13 million words." The line of thinking following their study is that children from more affluent households would enter school knowing more words, which would give them advantage in school.

Hart and Risley's research has been criticized by scholars. Critics theorize that the language and achievement gaps are not a result of the number of words a child is exposed to, but rather alternative theories suggest it could reflect the disconnect of linguistic practices between home and school. Thus, judging academic success and linguistic capabilities from socioeconomic status may ignore bigger societal issues. A recent replication of Hart and Risley's study with more participants has found that the "word gap" may be closer to 4 million words, not the oft-cited 30 million words previously proposed. The ongoing word gap research is evidence of the importance of language development in early childhood.

Video 4. Watch as Dr. John Gabrieli, from the MIT McGovern Institute for Brain Development explains how early language exposure affects language

development. His research uses the current technology to correlate home language experiences with brain function. They determined that the number of conversational turns was more important to development in Broca's area (brain region linked to speech production) than the number of words heard or the family's socioeconomic status.

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Grammar and Flexibility

Older children are also able to learn new rules of grammar with more flexibility. While younger children are likely to be reluctant to give up saying "I goed there", older children will learn this rather quickly along with other rules of grammar.

Bilingualism

Although monolingual speakers often do not realize it, the majority of children around the world are **Bilingual**, *meaning that they understand and use two languages* (Meyers- Sutton, 2005). Even in the United States, which is a relatively monolingual society, more than 47 million people speak a language other than English at home, and about 10 million of these people are children or youths in public schools (United States Department of Commerce, 2003). The large majority of bilingual students (75%) are Hispanic, but the rest represent more than a hundred different language groups from around the world. In larger communities throughout the United States, it is therefore common for a single classroom to contain students from several language backgrounds at once. In classrooms, as in other social settings, bilingualism exists in different forms and degrees. At one extreme are students who speak both English and another language fluently; at the other extreme are those who speak only limited versions of both languages. In between are students who speak their home (or heritage) language much better than English, as well as others who have partially lost their heritage language in the process of learning English (Tse, 2001). Commonly, a student may speak a language satisfactorily but be challenged by reading or writing it. Whatever the case, each bilingual student poses unique challenges to teachers.

The student who speaks both languages fluently has a definite cognitive advantage. As you might suspect and research confirmed, a fully fluent bilingual student is in a better position to express concepts or ideas in more than one way, and to be aware of doing so (Jimenez, Garcia, & Pearson, 1995; Francis, 2006). Unfortunately, the bilingualism of many students is unbalanced in the sense that they are either still learning English, or else they have lost some earlier ability to use their original, heritage language. Losing one's original language is a concern as research finds that language loss limits students' ability to learn English as well or as quickly as they

could do. Having a large vocabulary in a first language has been shown to save time in learning vocabulary in a second language (Hansen, Umeda & McKinney, 2002). Preserving the first language is important if a student has impaired skill in all languages and therefore needs intervention or help from a speech-language specialist. Research has found, in such cases, that the specialist can be more effective if the specialist speaks and uses the first language as well as English (Kohnert, Yim, Nett, Kan, & Duran, 2005).

Watch It

Video 5. This video explains some of the research surrounding language acquisition in babies, particularly those learning a second language.

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Theories of Language Development

Psychological theories of language learning differ in terms of the importance they place on nature and nurture. Remember that we are a product of both nature and nurture. Researchers now believe that language acquisition is partially inborn and partially learned through our interactions with our linguistic environment (Gleitman & Newport, 1995; Stork & Widdowson, 1974).

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Video 6. *Theories of Language Development* discusses the major theories of how language develops in children.

Learning Theory

Perhaps the most straightforward explanation of language development is that it occurs through the principles of learning, including association and reinforcement (Skinner, 1953). Additionally, Bandura (1977) described the importance of observation and imitation of others in learning language. There must be at least some truth to the idea that language is learned through environmental interactions or nurture. Children learn the language that they hear spoken around them rather than some other language. Also supporting this idea is the gradual improvement of language skills with time. It seems that children modify their language through imitation and reinforcement, such as parental praise and being understood. For example, when a two-

year-old child asks for juice, he might say, "me juice," to which his mother might respond by giving him a cup of apple juice.

However, language cannot be entirely learned. For one, children learn words too fast for them to be learned through reinforcement. Between the ages of 18 months and 5 years, children learn up to 10 new words every day (Anglin, 1993). More importantly, language is more *generative* than it is imitative**.** Language is not a predefined set of ideas and sentences that we choose when we need them, but rather a system of rules and procedures that allows us to create an infinite number of statements, thoughts, and ideas, including those that have never previously occurred. When a child says that she "swimmed" in the pool, for instance, she is showing generativity. No adult speaker of English would ever say "swimmed," yet it is easily generated from the normal system of producing language.

Other evidence that refutes the idea that all language is learned through experience comes from the observation that children may learn languages better than they ever hear them. Deaf children whose parents do not speak ASL very well nevertheless are able to learn it perfectly on their own, and may even make up their own language if they need to (Goldin-Meadow & Mylander, 1998). A group of deaf children in a school in Nicaragua, whose teachers could not sign, invented a way to communicate through made-up signs (Senghas, Senghas, & Pyers, 2005). The development of this new Nicaraguan Sign Language has continued and changed as new generations of students have come to the school and started using the language. Although the original system was not a real language, it is becoming closer and closer every year, showing the development of a new language in modern times.

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Nativism

The linguist Noam Chomsky is a believer in the nature approach to language, arguing that human brains contain a **Language Acquisition Device** that includes a *universal grammar* that underlies all human language (Chomsky, 1965, 1972). According to this approach, each of the many languages spoken around the world (there are between 6,000 and 8,000) is an individual example of the same underlying set of procedures that are hardwired into human brains. Chomsky's account proposes that children are born with a knowledge of general rules of syntax that determine how sentences are constructed. Language develops as long as the infant is exposed to it. No teaching, training, or reinforcement is required for language to develop as proposed by Skinner.

Chomsky differentiates between the **deep structure** of an idea; that is, *how the idea is represented in the fundamental universal grammar that is common to all languages*, and the **surface structure** of the idea or *how it is expressed in any one language*. Once we hear or express a thought in surface structure, we generally forget exactly how it happened. At the end of a lecture, you will remember a lot of the deep structure (i.e., the ideas expressed by the instructor), but you cannot reproduce the surface structure (the exact words that the instructor used to communicate the ideas).

Although there is general agreement among psychologists that babies are genetically programmed to learn language, there is still debate about Chomsky's idea that there is a universal grammar that

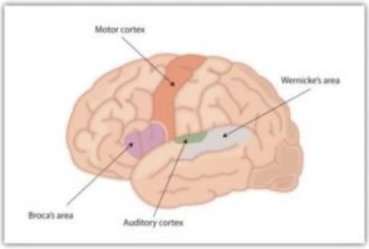
can account for all language learning. Evans and Levinson (2009) surveyed the world's languages and found that none of the presumed underlying features of the language acquisition device were entirely universal. In their search they found languages that did not have noun or verb phrases, that did not have tenses (e.g., past, present, future), and even some that did not have nouns or verbs at all, even though a basic assumption of a universal grammar is that all languages should share these features.

Critical Periods

Anyone who has tried to master a second language as an adult knows the difficulty of language learning. Yet children learn languages easily and naturally. Children who are not exposed to language early in their lives will likely never learn one. Case studies, including Victor the "Wild Child," who was abandoned as a baby in France and not discovered until he was 12, and Genie, a child whose parents kept her locked in a closet from 18 months until 13 years of age, are (fortunately) two of the only known examples of these deprived children. Both of these children made some progress in socialization after they were rescued, but neither of them ever developed language (Rymer, 1993). This is also why it is important to determine quickly if a child is deaf, and to communicate in sign language immediately. Deaf children who are not exposed to sign language during their early years will likely never learn it (Mayberry, Lock, & Kazmi, 2002). The concept of

critical periods highlights the importance of both nature and nurture for language development.

Brain Areas for Language



For the 90% of people who are right-handed, language is stored and controlled by the left cerebral cortex, although for some left-handers this pattern is reversed. These differences can easily be seen in the results of neuroimaging studies that show that listening to and producing language creates greater activity in the left hemisphere than in the right. **Broca's area**, *an area in front of the left hemisphere near the motor cortex*, *is responsible for language production* (Figure 3.21). This area was first localized in the 1860s by the French physician Paul Broca, who studied patients with lesions to various parts of the brain. **Wernicke's area**, *an area of the brain next to the auditory cortex*, *is responsible for language comprehension.*

Figure 2. Drawing of Brain Showing Broca's and Wernicke's Areas for most people the left hemisphere is specialized for language. Broca's area, near the motor cortex, is involved in language production, whereas Wernicke's area, near the auditory cortex, is specialized for language comprehension.

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Video 7. *Language and the Brain* reviews major brain structures and functions involved in language.

Interactionist Approach

The **interactionist approach** (sociocultural theory) combines ideas from psychology and biology to explain how language is developed. According to this theory, children learn language out of a desire to communicate with the world around them. Language emerges from, and is dependent upon, social interaction. The Interactionist approach claims that if our language ability develops out of a desire to communicate, then language is dependent upon whom we want to communicate with. This means the environment you grow up in will heavily affect how well and how quickly you learn to talk. For example, infants being raised by only their mother are more likely to learn the word "mama", and less likely to develop "dada". Among the first words we learn are ways to demand attention or food. If you've ever tried to learn a new language, you may recognize this theory's influence. Language classes often teach commonly used vocabulary and phrases first, and then focus on building conversations rather than simple rote memorization. Even when we expand our vocabularies in our native language, we remember the words we use the most.

Social pragmatics

Language from this view is not only a cognitive skill but also a social one. Language is a tool humans use to communicate, connect to, influence, and inform others. Most of all, language comes out of a need to cooperate. The social nature of language has been demonstrated by a number of studies that have shown that children use several pre-linguistic skills (such as pointing and other gestures) to communicate not only their own needs but what others may need. So a child watching her mother search for an object may point to the object to help her mother find it.

Eighteen-month to 30-month-olds have been shown to make linguistic repairs when it is clear that another person does not understand them (Grosse, Behne, Carpenter & Tomasello, 2010). Grosse et al. (2010) found that even when the child was given the desired object, if there had been any misunderstanding along the way (such as a delay in being handed the object, or the experimenter calling the object by the wrong name), children would make linguistic repairs. This would suggest that children are using language not only as a means of achieving some material goal, but to make themselves understood in the mind of another person.

Vygotsky and Language Development

Lev Vygotsky hypothesized that children had a **zone of proximal development (ZPD)**. The ZPD is the range of material that a child is ready to learn if proper support and guidance are given from either a peer who understands the material or by an adult. We can see the benefit of this sort of guidance when we think about the acquisition of language. Children can be assisted in learning language by others who listen attentively, model more accurate pronunciations and encourage elaboration. For example, if the child exclaims, “I’m goed there!” then the adult responds, “You went there?”

Children may be hard-wired for language development, as Noam Chomsky suggested in his theory of universal grammar, but active participation is also important for language development. The process of **scaffolding** is one in which the guide provides needed assistance to the child as a new skill is learned. Repeating what a child has said, but in a grammatically correct way, is scaffolding for a child who is struggling with the rules of language production.

Private Speech

Do you ever talk to yourself? Why? Chances are, this occurs when you are struggling with a problem, trying to remember something or feel very emotional about a situation. Children talk to themselves too. Piaget interpreted this as egocentric speech or a practice engaged in because of a child's inability to see things from other points of view. Vygotsky, however, believed that children talk to themselves in order to solve problems or clarify thoughts. As children learn to think in words, they do so aloud before eventually closing their lips and engaging in **private speech** or inner speech. Thinking out loud eventually becomes thought accompanied by internal speech, and talking to oneself becomes a practice only engaged in when we are trying to learn something or remember something, etc. This inner speech is not as elaborate as the speech we use when communicating with others (Vygotsky, 1962).

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Intelligence

For nearly a century, educators and psychologists have debated the nature of intelligence, and more specifically whether intelligence is just one broad ability or can take more than one form. Many classical definitions of the concept have tended to define **intelligence** as a single broad ability that allows a person to solve or complete many sorts of tasks, or at least many academic tasks like reading, knowledge of vocabulary, and the solving of logical problems (Garlick, 2002). Other psychologists believe that instead of a single factor, intelligence is a collection of distinct abilities. Still, other psychologists believe that intelligence should be defined in more practical terms. We'll review three perspectives on intelligence, Spearman's g, Sternberg's Triarchic Theory of Intelligence, and Gardner's Frame of Mind. Understanding theories of intelligence will help us understand variations in students' intellectual abilities.

British psychologist Charles Spearman believed intelligence consisted of one general factor, called *g*, which could be measured and compared among individuals. Spearman focused on the commonalities among various intellectual abilities and deemphasized what made each unique. There is research evidence of such a global ability, and the idea of general intelligence often fits with society's everyday beliefs about intelligence. Partly for these reasons, an entire mini-industry has grown up around publishing tests of intelligence, academic ability, and academic achievement. Since these tests affect the work of teachers, I return to discussing them later in this book.

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Video 1. *Intelligence* explains the different definitions of intelligence and the nature/nurture debate in the context of intelligence.

Measuring Intelligence: Standardization and the Intelligence Quotient

The goal of most intelligence tests is to measure "g," the general intelligence factor. Good intelligence tests are **reliable,** *meaning that they are consistent over time*, and also demonstrate **validity,** *meaning that they actually measure intelligence rather than something else*. Because intelligence is such an important individual difference dimension, psychologists have invested substantial effort in creating and improving measures of intelligence, and these tests are now considered the most accurate of all psychological tests. In fact, the ability to accurately assess intelligence is one of the most important contributions of psychology to everyday public life.

Intelligence changes with age. A 3-year-old who could accurately multiply 183 by 39 would certainly be intelligent, but a 25-year-old who could not do so would be seen as unintelligent. Thus understanding intelligence requires that we know the norms or standards in a given population of people at a given age. The **standardization** of a test involves giving it to a large number of people at different ages and computing the average score on the test at each age level.

It is important that intelligence tests be standardized on a regular basis, because the overall level of intelligence in a population may

change over time. The **Flynn effect** refers to *the observation that scores on intelligence tests worldwide have increased substantially over the past decades* (Flynn, 1999). Although the increase varies somewhat from country to country, the average increase is about 3 IQ points every 10 years. There are many explanations for the Flynn effect, including better nutrition, increased access to information, and more familiarity with multiple-choice tests (Neisser, 1998). But whether people are actually getting smarter is debatable (Neisser, 1997).

Once the standardization has been accomplished, we have a picture of the average abilities of people at different ages and can calculate a person's **mental age**, which is *the age at which a person is performing intellectually*. If we compare the mental age of a person to the person's chronological age, the result is the **intelligence quotient (IQ),** *a measure of intelligence that is adjusted for age*. A simple way to calculate IQ is by using the following formula:

$$\text{IQ} = \text{mental age} \div \text{chronological age} \times 100.$$

Thus a 10-year-old child who does as well as the average 10-year-old child has an IQ of 100 (10 ÷ 10 × 100), whereas an 8-year-old child who does as well as the average 10-year-old child would have an IQ of 125 (10 ÷ 8 × 100). Most modern intelligence tests are based on the relative position of a person's score among people of the same age, rather than on the basis of this formula, but the idea of an intelligence "ratio" or "quotient" provides a good description of the score's meaning.

1. Which of the following is the most similar to 1313323?

A. ACACCBC

B. CACAABC

C. ABABBCA

D. ACACCDC

2. Jenny has some chocolates. She eats two and gives half of the remainder to Lisa. If Lisa has six chocolates how many does Jenny have in the beginning?

A. 6

B. 12

C. 14

D. 18

3. Which of the following items is not like the others in the list?

duck, raft, canoe, stone, rubber ball

A. Duck

B. Canoe

C. Stone

D. Rubber ball

4. What do steam and ice have in common?

A. They can both harm skin

B. They are both made from water

C. They are both found in the kitchen

D. They are both the products of water at extreme temperatures

Answers: 1) B; 2) C; 3) stone; 4) D is the most sophisticated answer

Figure 1. Examples of the types of items you might see on an intelligence test.

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Wechsler Scales

The **Wechsler Adult Intelligence Scale (WAIS)** is the most widely used intelligence test for adults (Watkins, Campbell, Nieberding, & Hallmark, 1995). The current version of the WAIS, the WAIS-IV, was standardized on 2,200 people ranging from 16 to 90 years of age. It consists of 15 different tasks, each designed to assess intelligence, including working memory, arithmetic ability, spatial ability, and general knowledge about the world. The WAIS-IV yields scores on four domains: verbal, perceptual, working memory, and processing speed. The reliability of the test is high (more than 0.95), and it shows substantial construct validity. The WAIS-IV is correlated highly with other IQ tests such as the Stanford-Binet, as well as with criteria of academic and life success, including college grades, measures of work performance, and occupational level. It also shows significant correlations with measures of everyday functioning among people with intellectual disabilities.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=93#oembed-3

Video 2. *Brain vs. Bias* provides an overview of the WAIS & WISC tests, standardization and validity, and IQ performance.

The Wechsler scale has also been adapted for preschool children in the form of the *Wechsler primary and preschool scale of intelligence-fourth edition* (WPPSI-IV) and for older children and adolescents in the form of the *Wechsler intelligence scale for children-fifth edition* (WISC-V).

Bias in Intelligence Testing

Intelligence tests and psychological definitions of intelligence have been heavily criticized since the 1970s for being biased in favor of Anglo-American, middle-class respondents and for being inadequate tools for measuring non-academic types of intelligence or talent. Intelligence changes with experience, and intelligence quotients or scores do not reflect that ability to change. What is considered smart varies culturally as well, and most intelligence tests do not take this variation into account. For example, in the West, being smart is associated with being quick. A person who answers a question the fastest is seen as the smartest, but in some cultures, being smart is associated with considering an idea thoroughly before giving an answer. A well- thought out, contemplative answer is the best answer.

watch it

Video 3. Watch this video to learn more about the history behind intelligence testing.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=93#oembed-4

Theories of Intelligence

Psychologists have long debated how to best conceptualize and measure intelligence (Sternberg, 2003). These questions include how many types of intelligence there are, the role of nature versus nurture in intelligence, how intelligence is represented in the brain, and the meaning of group differences in intelligence.

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Video 6.6.2. *Theories of Intelligence* reviews a few of the different theoretical views of intelligence.

General Intelligence Factor ("g")

From 1904-1905 the French psychologist Alfred Binet (1857–1914) and his colleague Théodore Simon (1872–1961) began working on behalf of the French government to develop a measure that would identify children who would not be successful with the regular school curriculum. The goal was to help teachers better educate these students (Aiken, 1994). Binet and Simon developed what most psychologists today regard as the first intelligence test, which consisted of a wide variety of questions that included the ability to name objects, define words, draw pictures, complete sentences, compare items, and construct sentences.

Binet and Simon (Binet, Simon, & Town, 1915; Siegler, 1992) believed that the questions they asked the children all assessed the basic abilities to understand, reason, and make judgments. It turned out that the correlations among these different types of measures were, in fact, all positive; that is, students who got one item correct were more likely to also get other items correct, even though the questions themselves were very different.

On the basis of these results, the psychologist Charles Spearman (1863–1945) hypothesized that there must be a single underlying construct that all of these items measure. He called the construct that the different abilities and skills measured on intelligence tests have in common the **general intelligence factor (*g*).** Virtually all psychologists now believe that there is a generalized intelligence factor, "g," that relates to abstract thinking and that includes the abilities to acquire knowledge, to reason abstractly, to adapt to novel situations, and to benefit from instruction and experience (Gottfredson, 1997; Sternberg, 2003). People with higher general intelligence learn faster.

Soon after Binet and Simon introduced their test, the American psychologist Lewis Terman at Stanford University (1877–1956) developed an American version of Binet's test that became known as the *Stanford- Binet intelligence test*. The Stanford-Binet is a measure of general intelligence made up of a wide variety of tasks, including vocabulary, memory for pictures, naming of familiar objects, repeating sentences, and following commands.

Sternberg's Triarchic theory

Although there is general agreement among psychologists that "g" exists, there is also evidence for **specific intelligence** "s," *a measure of specific skills in narrow domains*. One empirical result in support of the idea of "s" comes from intelligence tests themselves. Although the different types of questions do correlate with each other, some items correlate more highly with each other than do other items; they form clusters or clumps of intelligences.

One advocate of the idea of multiple intelligences is the psychologist Robert Sternberg. Sternberg has proposed a **Triarchic (three-part) Theory of Intelligence** that proposes that *people may display more or less analytical intelligence, creative intelligence, and practical intelligence*. Sternberg (1985, 2003) argued that traditional intelligence tests assess **analytical intelligence**, *academic problem solving and performing calculations*, but that they do not typically assess **creative intelligence**, *the ability to adapt to new situations and create new ideas*, and/or **practical intelligence**, *the ability to demonstrate common sense and street- smarts.*

As Sternberg proposed, research has found that creativity is not highly correlated with analytical intelligence (Furnham & Bakhtiar, 2008), and exceptionally creative scientists, artists, mathematicians, and engineers do not score higher on intelligence than do their less creative peers (Simonton, 2000). Furthermore, the brain areas that are associated with **convergent thinking**, *thinking that is directed*

toward finding the correct answer to a given problem, are different from those associated with **divergent thinking**, *the ability to generate many different ideas or solutions to a single problem* (Tarasova, Volf, & Razoumnikova, 2010). On the other hand, being creative often takes some of the basic abilities measured by "g," including the abilities to learn from experience, to remember information, and to think abstractly (bink & marsh, 2000). Ericsson (1998), Weisberg (2006), Hennessey and Amabile (2010), and Simonton (1992) studied creative people and identified at least five components that are likely to be important for creativity as listed in the table below.

Table 6.6.1. Important components for creativity

Component	Description
Expertise	Creative people have studied and learned about a topic
Imaginative Thinking	Creative people view problems in new and different ways
Risk-Taking	Creative people take on new, but potentially risky approaches
Intrinsic Interest	Creative people take on projects for interest, not money
Working in Creative Environments	The most creative people are supported, aided, and challenged by other people working on similar projects

The last aspect of the triarchic model, practical intelligence, refers primarily to intelligence that cannot be gained from books or formal learning. Practical intelligence represents a type of "street smarts" or "common sense" that is learned from life experiences. Although a number of tests have been devised to measure practical intelligence (Sternberg, Wagner, & Okazaki, 1993; Wagner & Sternberg, 1985), research has not found much

evidence that practical intelligence is distinct from "g" or that it is predictive of success at any particular tasks (Gottfredson, 2003). Practical intelligence may include, at least in part, certain abilities that help people perform well at specific jobs, and these abilities may not always be highly correlated with general intelligence (Sternberg et al., 1993).

Gardner's Frame of Mind

Theory of multiple intelligences: another champion of the idea of specific types of intelligences rather than one overall intelligence is the psychologist Howard Gardner (1983, 1999). Gardner argued that it would be evolutionarily functional for different people to have different talents and skills, and proposed that there are eight intelligences that can be differentiated from each other. A potential ninth intelligence, existential intelligence, still needs empirical support. Gardner investigated intelligences by focusing on children who were talented in one or more areas and adults who suffered from strokes that compromised some capacities, but not others. Gardner also noted that some evidence for multiple intelligences comes from the abilities of **autistic savants**, *people who score low on intelligence tests overall but who nevertheless may have exceptional skills in a given domain*, such as math, music, art, or in being able to recite statistics in a given sport (Treffert & Wallace, 2004). In addition to brain damage and the existence of savants, Gardner identified these 8 intelligences based on other criteria, including a set developmental history and psychometric findings. See table 5.4 for a list of Gardner's eight specific intelligences.

Table 6.6.2. Howard Gardner's eight specific intelligences

Intelligence	Description
Linguistic	The ability to speak and write well
Logical-mathematical	The ability to use logic and mathematical skills to solve problems
Spatial	The ability to think and reason about objects in three dimensions
Musical	The ability to perform and enjoy music
Kinesthetic (body)	The ability to move the body in sports, dance, or other physical activities
Interpersonal	The ability to understand and interact effectively with others
Intrapersonal	The ability to have insight into the self
Naturalistic	The ability to recognize, identify, and understand animals, plants, and other living things

Source: Adapted from Gardner, H. (1999). *Intelligence Framed: Multiple Intelligences for the 21st Century*. New York, NY: Basic Books.

The idea of multiple intelligences has been influential in the field of education, and teachers have used these ideas to try to teach differently to different students. For instance, to teach math problems to students who have particularly good kinesthetic intelligence, a teacher might encourage the students to move their bodies or hands according to the numbers. On the other hand, some have argued that these "intelligences" sometimes seem more like "abilities" or "talents" rather than real intelligence. There is no clear conclusion about how many intelligences there are. Our sense of humor, artistic skills, dramatic skills, and so forth also separate intelligences? Furthermore, and again demonstrating the underlying power of a single intelligence, the many different intelligences are, in fact, correlated and thus represent, in part, "g" (Brody, 2003).

https://lumenlearning.h5p.com/content/1290777754718118168/embed

Extremes of Intelligence: Intellectual Disability and Giftedness

The results of studies assessing the measurement of intelligence show that IQ is distributed in the population in the form of a **Normal Distribution (or bell curve),** which *is the pattern of scores usually observed in a variable that clusters around its average*. In a normal distribution, the bulk of the scores fall toward the middle, with many fewer scores falling at the extremes. The normal distribution of intelligence shows that on IQ tests, as well as on most other measures, the majority of people cluster around the average (in this case, where IQ = 100), and fewer are either very smart or very dull (see Figure 5.10). Because the standard deviation of an IQ test is about 15, this means that about 2% of people score above an IQ of 130, often considered the threshold for giftedness, and about the same percentage score below an IQ of 70, often being considered the threshold for intellectual disability.

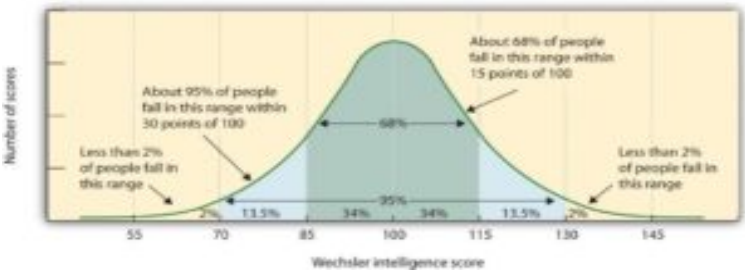

Figure 6.6.2. Distribution of IQ Scores in the General PopulationThe normal distribution of IQ scores in the general population shows that most people have about average intelligence, while very few have extremely high or extremely low intelligence.

People with very low IQ define one end of the distribution of intelligence scores. **Intellectual disability** (or **intellectual**

developmental disorder) is assessed based on cognitive capacity (IQ) and adaptive functioning. The severity of the disability is based on adaptive functioning, or how well the person handles everyday life tasks. About 1% of the United States population, most of them males, fulfill the criteria for intellectual developmental disorder, but some children who are given this diagnosis lose the classification as they get older and better learn to function in society. A particular vulnerability of people with low IQ is that they may be taken advantage of by others, and this is an important aspect of the definition of intellectual developmental disorder (Greenspan, Loughlin, & Black, 2001).

Giftedness *refers to those who have an IQ of 130 or higher* (Lally & Valentine-French, 2015). Having an extremely high IQ is clearly less of a problem than having an extremely low IQ, but there may also be challenges to being particularly smart. It is often assumed that schoolchildren who are labeled as "gifted" may have adjustment problems that make it more difficult for them to create social relationships. To study gifted children, Lewis Terman and his colleagues (Terman & Oden, 1959) selected about 1,500 high school students who scored in the top 1% on the Stanford-Binet and similar IQ tests (i.e., who had IQs of about 135 or higher), and tracked them for more than seven decades (the children became known as the "termites" and are still being studied today). This study found that these students were not unhealthy or poorly adjusted, but rather were above average in physical health and were taller and heavier than individuals in the general population. The students also had above-average social relationships and were less likely to divorce than the average person (Seagoe, 1975).

Terman's study also found that many of these students went on to achieve high levels of education and entered prestigious professions, including medicine, law, and science. Of the sample, 7% earned doctoral degrees, 4% earned medical degrees, and 6% earned law degrees. These numbers are all considerably higher than what would have been expected from a more general population. Another study of young adolescents who had even higher IQs found

that these students ended up attending graduate school at a rate more than 50 times higher than that in the general population (Lubinski & Benbow, 2006).

As you might expect based on our discussion of intelligence, kids who are gifted have higher scores on general intelligence "g," but there are also different types of giftedness. Some children are particularly good at math or science, some at automobile repair or carpentry, some at music or art, some at sports or leadership, and so on. There is a lively debate among scholars about whether it is appropriate or beneficial to label some children as "gifted and talented" in school and to provide them with accelerated special classes and other programs that are not available to everyone. Although doing so may help the gifted kids (Colangelo & Assouline, 2009), it also may isolate them from their peers and make such provisions unavailable to those who are not classified as "gifted."

Education Issues

Often, we use the terms "schooling" and "education" interchangeably, but they have different meanings. Education is not solely concerned with the basic academic concepts that a student learns in the classroom. Education is a social institution through which a society's children are taught basic academic knowledge, learning skills, and cultural norms. Societies also educate their children outside of the school system in matters of everyday practical living. These two types of learning are referred to as formal education and informal education.

Formal education describes the learning of academic facts and concepts through a formal curriculum. Arising from the tutelage of ancient Greek thinkers, centuries of scholars have examined topics through formalized methods of learning. Education in earlier times was only available to the higher classes; they had the means for access to scholarly materials, plus the luxury of leisure time that could be used for learning. The Industrial Revolution and its accompanying social changes made education more accessible to the general population. Many families in the emerging middle class found new opportunities for schooling.

The modern U.S. educational system is the result of this progression. Today, basic education is considered a right and responsibility for all citizens. Expectations of this system focus on formal education, with curricula and testing designed to ensure that students learn the facts and concepts that society believes are basic knowledge.

In contrast, **informal education** describes learning about cultural values, norms, and expected behaviors by participating in society. This type of learning occurs both through the formal education system and at home. Our earliest learning experiences generally happen via parents, relatives, and others in our community. Through informal education, we learn how to dress for different

occasions, how to perform regular life routines like shopping for and preparing food, and how to keep our bodies clean.

The Functions of Schools

Schools teach us far more than reading, writing, and arithmetic. They also socialize us to cultural norms and expectations of our society. These cultural expectations and norms are reinforced by our teachers, our textbooks, and our classmates. (For students outside the dominant culture, this aspect of the education system can pose significant challenges.) You might remember learning your multiplication tables in second grade and also learning the social rules of taking turns on the swings at recess. You might recall learning about the U.S. Constitution in an American Government course as well as learning when and how to speak up in class.

Schools are one of the more important social institutions in a society and contribute to two kinds of functions: manifest (or primary) functions, which are the intended and visible functions of education; and latent (or secondary) functions, which are the hidden and unintended functions.

Manifest Functions of Education

There are several major manifest functions associated with education. The first is socialization. Beginning in preschool and kindergarten, students are taught to practice various societal roles. The French sociologist Émile Durkheim (1858–1917), who established the academic discipline of sociology, characterized schools as "socialization agencies that teach children how to get along with others and prepare them for adult economic roles" (Durkheim 1898).

Indeed, it seems that schools have taken on this responsibility in full.

This socialization also involves learning the rules and norms of society as a whole. In the early days of compulsory education, students learned the dominant culture. Today, since the culture of the United States is increasingly diverse, students may learn a variety of cultural norms, not only that of the dominant culture.

School systems in the United States also transmit the core values of the nation through manifest functions like social control. One of the roles of schools is to teach students conformity to law and respect for authority. Obviously, such respect, given to teachers and administrators, will help a student navigate the school environment. This function also prepares students to enter the workplace and the world at large, where they will continue to be subject to people who have authority over them. The fulfillment of this function rests primarily with classroom teachers and instructors who are with students all day.

Education also provides one of the major methods used by people for upward social mobility. This function is referred to as **social placement**. College and graduate schools are viewed as vehicles for moving students closer to careers that will give them the financial freedom and security they seek. As a result, college students are often more motivated to study areas that they believe will be advantageous on the social ladder. A student might value business courses over a class in Victorian poetry because she sees business class as a stronger vehicle for financial success.

Latent Functions of Education

Education also fulfills latent functions. As you well know, much goes on in a school that has little to do with formal education. For example, you might notice an attractive fellow student when he gives a particularly interesting answer in class—catching up with

him and making a date speaks to the latent function of courtship fulfilled by exposure to a peer group in the educational setting.

The educational setting introduces students to social networks that might last for years and can help people find jobs after their schooling is complete. Of course, with social media such as Facebook and LinkedIn, these networks are easier than ever to maintain. Another latent function is the ability to work with others in small groups, a skill that is transferable to a workplace, and that might not be learned in a homeschool setting.

The educational system, especially as experienced on university campuses, has traditionally provided a place for students to learn about various social issues. There is ample opportunity for social and political advocacy, as well as the ability to develop tolerance to the many views represented on campus. In 2011, the Occupy Wall Street movement swept across college campuses all over the United States, leading to demonstrations in which diverse groups of students were unified with the purpose of changing the political climate of the country.

Another role of schools, according to functionalist theory, is that of **sorting** or classifying students based on academic merit or potential. The most capable students are identified early in schools through testing and classroom achievements. Such students are placed in accelerated programs in anticipation of successful college attendance.

School, particularly in recent years, is taking over some of the functions that were traditionally undertaken by family. Society relies on schools to teach about human sexuality as well as basic skills such as budgeting and job applications—topics that at one time, were addressed by the family.

Table 1. Manifest and Latent Functions of Education

Manifest Functions: Openly stated functions with intended goals	**Latent Functions: Hidden, unstated functions with sometimes unintended consequences**
Socialization	Courtship
Transmission of culture	Social networks
Social control	Working in groups
Social placement	Creation of generation gap
Cultural innovation	Political and social integration

Student Diversity

Diversity means different things to different people, and it can be understood differently in different environments. In the context of education, diversity generally refers to the differences among people in the school environment by race, culture, ethnicity, religion, socioeconomic status, sexual orientation, abilities, opinions, political views, and in other ways. We also think about how groups interact with one another, given their differences (even if they're just perceived differences.) How do diverse populations experience and explore their relationships?

Students have, of course, always been diverse. Whether in the past or in the present day, students learn at unique paces, show unique personalities, and learn in their own ways. In recent decades, though, the forms and extent of diversity have increased. Now more than ever, teachers are likely to serve students from diverse language backgrounds, to serve more individuals with special educational needs, and to teach students either younger and older than in the past.

Cultural and Language Diversity

Take the case of language diversity. In the United States, about 40 million people, or 14% of the population are Hispanic. About 20% of these speak primarily Spanish, and approximately another 50% speak only limited English (United States Census Bureau, 2005). The educators responsible for the children in this group need to accommodate instruction to these students somehow. Part of the solution, of course, is to arrange specialized second-language teachers and classes. But adjustment must also happen in "regular" classrooms of various grade levels and subjects. Classroom teachers must learn to communicate with students whose English language background is limited, at the same time that the students themselves are learning to use English more fluently (Pitt, 2005). Since relatively few teachers are Hispanic or speak fluent Spanish, the adjustments can sometimes be a challenge. Teachers must plan lessons and tasks that students actually understand. At the same time, teachers must also keep track of the major learning goals of the curriculum.

- Cultures and ethnic groups differ not only in languages but also in how languages are used. Since some of the patterns differ from those typical of modern classrooms, they can create misunderstandings between teachers and students (Cazden, 2001; Rogers et al., 2005). Consider these examples:
- In some cultures, it is considered polite or even intelligent not to speak unless you have something truly important to say. Chitchat, or talk that simply affirms a personal tie between people, is considered immature or intrusive (Minami, 2002). In a classroom, this habit can make it easier for a child to learn not to interrupt others, but it can also make the child seem unfriendly.
- Eye contact varies by culture. In many African American and Latin American communities, it is considered appropriate and

respectful for a child not to look directly at an adult who is speaking to them (Torres-Guzman, 1998). In classrooms, however, teachers often expect a lot of eye contact (as in "I want all eyes on me!") and may be tempted to construe a lack of eye contact as a sign of indifference or disrespect.

- Social distance varies by culture. In some cultures, it is common to stand relatively close when having a conversation; in others, it is more customary to stand relatively far apart (Beaulieu, 2004). Problems may happen when a teacher and student prefer different social distances. A student who expects a closer distance than does the teacher may seem overly familiar or intrusive, whereas one who expects a longer distance may seem overly formal or hesitant.
- Wait time varies by culture. Wait time is the gap between the end of one person's comment or question and the next person's reply or answer. In some cultures, wait time is relatively long, as long as three or four seconds (Tharp & Gallimore, 1989). In others, it is a negative gap, meaning that it is acceptable, even expected, for a person to interrupt before the end of the previous comment. In classrooms, the wait time is customarily about one second; after that, the teacher is likely to move on to another question or to another student. A student who habitually expects a wait time longer than one second may seem hesitant, and not be given many chances to speak. A student who expects a negative wait time, on the other hand, may seem overeager or even rude.
- In most non-Anglo cultures, questions are intended to gain information, and it is assumed that a person asking the question truly does not have the information requested (Rogoff, 2003). In most classrooms, however, teachers regularly ask test questions, which are questions to which the teacher already knows the answer, and that simply assess whether a student knows the answer as well (Macbeth, 2003). The question: "How much is 2 + 2?" for example, is a test question. If the student is not aware of this purpose, he or she may

become confused, or think that the teacher is surprisingly ignorant. Worse yet, the student may feel that the teacher is trying deliberately to shame the student by revealing the student's ignorance or incompetence to others.

- Preference for activities that are cooperative rather than competitive. Many activities in school are competitive, even when teachers try to de-emphasize the competition. Once past the first year or second year of school, students often become attentive to who receives the highest marks on an assignment, for example, or who is the best athlete at various sports or whose contributions to class discussions gets the most verbal recognition from the teacher (Johnson & Johnson, 1998). A teacher deliberately organizes important activities or assignments competitively, as in "Let's see who finishes the math sheet first." Classroom life can then become explicitly competitive, and the competitive atmosphere can interfere with cultivating supportive relationships among students or between students and the teacher (Cohen, 2004). For students who give priority to these relationships, competition can seem confusing at best and threatening at worst. A student may wonder, "What sort of sharing or helping with answers is allowed?" The answer to this question may be different depending on the cultural background of the student and teacher. What the student views as cooperative sharing may be seen by the teacher as laziness, freeloading, or even cheating.

Diversity of Special Educational Needs

Another factor making classrooms increasingly diverse has been the inclusion of students with disabilities into classrooms with non-disabled peers. In the United States, the trend began in the 1970s, but accelerated with the passage of the Individuals with Disabilities Education Act in 1975, and again when the Act was amended in

2004 (United States Government Printing Office, 2005). The law guarantees free, appropriate education for children with disabilities of any kind—whether the impairment is physical, cognitive, emotional, or behavioral. The laws also recognize that such students need special supports in order to learn or function effectively in a classroom with non-disabled peers, so they provide for special services (for example, teaching assistants) and procedures for making individualized educational plans for students with disabilities.

Children with Disabilities: Legislation

Since the 1970s, political and social attitudes have moved increasingly toward including people with disabilities in a wide variety of "regular" activities. In the United States, the shift is illustrated clearly in the Federal legislation that was enacted during this time. Three major laws were passed that guaranteed the rights of persons with disabilities, and of children and students with disabilities in particular. The third law has had the biggest impact on education.

Rehabilitation Act of 1973, Section 504: This law, the first of its kind, required that individuals with disabilities be accommodated in any program or activity that receives Federal funding (PL 93-112, 1973). Although this law was not intended specifically for education, in practice, it has protected students' rights in some extra-curricular activities (for older students) and in some child care or after-school care programs (for younger students). If those programs receive Federal funding of any kind, the programs are not allowed to exclude children or youths with disabilities, and they have to find reasonable ways to accommodate the individuals' disabilities.

Americans with Disabilities Act of 1990 (or ADA): This legislation also prohibited discrimination on the basis of disability, just as Section 504 of the Rehabilitation Act had done (PL 101-336, 1990).

Although the ADA also applies to all people (not just to students), its provisions are more specific and "stronger" than those of Section 504. In particular, ADA extends to all employment and jobs, not just those receiving Federal funding. It also specifically requires accommodations to be made in public facilities such as with buses, restrooms, and telephones. ADA legislation is therefore responsible for some of the "minor" renovations in schools that you may have noticed in recent years, like wheelchair-accessible doors, ramps, and restrooms, and public telephones with volume controls.

Individuals with Disabilities Education Act (or IDEA): As its name implied, this legislation was more focused on education than either Section 504 or ADA. It was first passed in 1975 and has been amended several times since, including most recently in 2004 (PL 108-446, 2004). To be eligible under IDEA, a student must be adversely affected in oral expression, listening comprehension, written expression, basic reading skills, reading fluency skills, reading comprehension, mathematics calculation, or mathematics problem-solving. In its current form, the law guarantees the following rights related to education for anyone with a disability from birth to age 21. The first two influence schooling in general, but the last three affect the work of classroom teachers rather directly:

- *Free, appropriate education*: An individual or an individual's family should not have to pay for education simply because the individual has a disability, and the educational program should be truly educational; i.e., not merely care-taking or babysitting the person.
- *Due process*: In case of disagreements between an individual with a disability and the schools or other professionals, there must be procedures for resolving the disagreements that are fair and accessible to all parties, including the person himself or herself or the person's representative.
- *Fair evaluation of performance in spite of disability*: Tests or other evaluations should not assume test-taking skills that a person with a disability cannot reasonably be expected to

have, such as holding a pencil, hearing or seeing questions, working quickly, or understanding and speaking orally. Evaluation procedures should be modified to allow for these differences. This provision of the law applies both to evaluations made by teachers and to school-wide or "high-stakes" testing programs.

- *Education in the "least restrictive environment"*: Education for someone with a disability should provide as many educational opportunities and options for the person as possible, both in the short term and in the long term. In practice, this requirement has meant including students in regular classrooms and school activities as much as possible, though often not totally.
- *An individualized educational program*: Given that every disability is unique, instructional planning for a person with a disability should be unique or individualized as well. In practice, this provision has led to classroom teachers planning individualized programs jointly with other professionals (like reading specialists, psychologists, or medical personnel) as part of a team.

Students with Disabilities

Students are eligible for the rights afforded under the IDEA if their academic achievement is being impacted due to a learning disability, autism spectrum disorder, visual or hearing impairment, orthopedic impairment, traumatic brain injury, speech or language impairment, intellectual disability, emotional disturbance, or other health impairment.

Learning Disabilities

A **Learning Disability** (or LD) is a specific impairment of academic learning that interferes with a specific aspect of schoolwork, and that reduces a student's academic performance significantly. An LD shows itself as a major discrepancy between a student's ability

and some feature of achievement: The student may be delayed in reading, writing, listening, speaking, or doing mathematics, but not in all of these at once. A learning problem is not considered a learning disability if it stems from physical, sensory, or motor handicaps, or from generalized intellectual impairment. It is also not an LD if the learning problem really reflects the challenges of learning English as a second language. Genuine LDs are the learning problems left over after these other possibilities are accounted for or excluded. Typically, a student with an LD has not been helped by teachers' ordinary efforts to assist the student when he or she falls behind academically, though what counts as an "ordinary effort," of course, differs among teachers, schools, and students. Most importantly, though, an LD relates to a fairly specific area of academic learning. A student may be able to read and compute well enough, for example, but not be able to write. LDs are by far the most common form of special educational need, accounting for half of all students with special needs in the United States and anywhere from 5 to 20% of all students, depending on how the numbers are estimated (United States Department of Education, 2005; Ysseldyke & Bielinski, 2002). Students with LDs are so common, in fact, that most teachers regularly encounter at least one per class in any given school year, regardless of the grade level they teach.

These difficulties are identified in school because this is when children's academic abilities are being tested, compared, and measured. Consequently, once academic testing is no longer essential in that person's life (as when they are working rather than going to school), these disabilities may no longer be noticed or relevant, depending on the person's job and the extent of the disability.

https://youtu.be/RKCNqHEzLwQ

Video 1. *Learning Disability* explains the different types of disabilities and their symptoms.

Dyslexia is one of the most commonly diagnosed disabilities and involves having difficulty in the area of reading. This diagnosis is used for a number of reading difficulties. Common characteristics

are difficulty with phonological processing, which includes the manipulation of sounds, spelling, and rapid visual/verbal processing. Additionally, the child may reverse letters, have difficulty reading from left to right, or may have problems associating letters with sounds. It appears to be rooted in neurological problems involving the parts of the brain active in recognizing letters, verbally responding, or being able to manipulate sounds. Recent studies have identified a number of genes that are linked to developing dyslexia (National Institute of Neurological Disorders and Stroke, 2016). Treatment typically involves altering teaching methods to accommodate the person's particular problematic area.

Dysgraphia, a writing disability, is often associated with dyslexia (Carlson, 2013). There are different types of dysgraphia, including phonological dysgraphia, when the person cannot sound out words and write them phonetically. Orthographic dysgraphia is demonstrated by those individuals who can spell regularly spelled words, but not irregularly spelled ones. Some individuals with dysgraphia experience difficulties in motor control and experience trouble forming letters when using a pen or pencil.

Dyscalculia refers to problems in math. Cowan and Powell (2014) identified several terms used when describing difficulties in mathematics, including dyscalculia, mathematical learning disability, and mathematics disorder. All three terms refer to students with average intelligence who exhibit poor academic performance in mathematics. When evaluating a group of third graders, Cowan and Powell (2014) found that children with dyscalculia demonstrated problems with working memory, reasoning, processing speed, and oral language, all of which are referred to as domain-general factors. Additionally, problems with multi-digit skills, including number system knowledge, were also exhibited.

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Autism Spectrum Disorder

Autism spectrum disorder (ASD) is probably the most misunderstood and puzzling of neurodevelopmental disorders. Children with this disorder show signs of significant disturbances in three main areas: (a) deficits in social interaction, (b) deficits in communication, and (c) repetitive patterns of behavior or interests. These disturbances appear early in life and cause serious impairments in functioning (APA, 2013). The child with autism spectrum disorder might exhibit deficits in social interaction by not initiating conversations with other children or turning their head away when spoken to. These children do not make eye contact with others and seem to prefer playing alone rather than with others. In a certain sense, it is almost as though these individuals live in a personal and isolated social world others are simply not privy to or able to penetrate. Communication deficits can range from a complete lack of speech to one-word responses (e.g., saying "Yes" or "No" when replying to questions or statements that require additional elaboration), echoed speech (e.g., parroting what another person says, either immediately or several hours or even days later), to difficulty maintaining a conversation because of an inability to reciprocate others' comments. These deficits can also include problems in using and understanding nonverbal cues (e.g., facial expressions, gestures, and postures) that facilitate normal communication.

Repetitive patterns of behavior or interests can be exhibited in a number of ways. The child might engage in stereotyped, repetitive

movements (rocking, head-banging, or repeatedly dropping an object and then picking it up), or she might show great distress at small changes in routine or the environment. For example, the child might throw a temper tantrum if an object is not in its proper place or if a regularly- scheduled activity is rescheduled. In some cases, the person with autism spectrum disorder might show highly restricted and fixated interests that appear to be abnormal in their intensity. For instance, the child might learn and memorize every detail about something, even though doing so serves no apparent purpose. Importantly, autism spectrum disorder is not the same thing as intellectual disability, although these two conditions can occur together. The DSM-5 specifies that the symptoms of autism spectrum disorder are not caused or explained by intellectual disability.

The qualifier "spectrum" in autism spectrum disorder is used to indicate that individuals with the disorder can show a range, or spectrum, of symptoms that vary in their magnitude and severity: Some severe, others less severe. The previous edition of the DSM included a diagnosis of Asperger's disorder, generally recognized as a less severe form of autistic disorder; individuals diagnosed with Asperger's disorder were described as having average or high intelligence and strong vocabulary, but exhibiting impairments in social interaction and social communication, such as talking only about their special interests (Wing, Gould, & Gillberg, 2011). However, because research has failed to demonstrate that Asperger's disorder differs qualitatively from autistic disorder, the DSM-5 does not include it. Some individuals with autism spectrum disorder, particularly those with better language and intellectual skills, can live and work independently as adults. However, most do not because the symptoms remain sufficient to cause serious impairment in many realms of life (APA, 2013).

Currently, estimates indicate that nearly 1 in 88 children in the United States have autism spectrum disorder; the disorder is 5 times more common in boys (1 out of 54) than girls (1 out of 252) (CDC, 2012). Rates of autistic spectrum disorder have increased

dramatically since the 1980s. For example, California saw an increase of 273% in reported cases from 1987 through 1998 (Byrd, 2002); between 2000 and 2008, the rate of autism diagnoses in the United States increased 78% (CDC, 2012). Although it is difficult to interpret this increase, it is possible that the rise in prevalence is the result of the broadening of the diagnosis, increased efforts to identify cases in the community, and greater awareness and acceptance of the diagnosis. In addition, mental health professionals are now more knowledgeable about autism spectrum disorder and are better equipped to make the diagnosis, even in subtle cases (Novella, 2008).

The exact causes of autism spectrum disorder remain unknown despite massive research efforts over the last two decades (Meek, Lemery-Chalfant, Jahromi, & Valiente, 2013). Autism appears to be strongly influenced by genetics, as identical twins show concordance rates of 60%– 90%, whereas concordance rates for fraternal twins and siblings are 5%–10% (Autism Genome Project Consortium, 2007). Many different genes and gene mutations have been implicated in autism (Meek et al., 2013). Among the genes involved are those important in the formation of synaptic circuits that facilitate communication between different areas of the brain (Gauthier et al., 2011). A number of environmental factors are also thought to be associated with increased risk for autism spectrum disorder, at least in part, because they contribute to new mutations. These factors include exposure to pollutants, such as plant emissions and mercury, urban versus rural residence, and vitamin D deficiency (Kinney, Barch, Chayka, Napoleon, & Munir, 2009).

There is no scientific evidence that a link exists between autism and vaccinations (Hughes, 2007). Indeed, a recent study compared the vaccination histories of 256 children with autism spectrum disorder with that of 752 control children across three time periods during their first two years of life (birth to 3 months, birth to 7 months, and birth to 2 years) (DeStefano, Price, & Weintraub, 2013). At the time of the study, the children were between 6 and 13 years old, and their prior vaccination records were obtained. Because

vaccines contain immunogens (substances that fight infections), the investigators examined medical records to see how many immunogens children received to determine if those children who received more immunogens were at greater risk for developing autism spectrum disorder. The results of this study clearly demonstrated that the number of immunogens from vaccines received during the first two years of life was not at all related to the development of autism spectrum disorder.

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Video 2. *Autism Spectrum Disorder* discusses the range of symptoms associated with ASD.

Other Health Impairment

Attention Deficit Hyperactivity Disorder (ADHD) is not a learning disability but can be considered as an 'other health impairment' if it is impacting academic performance. Individuals with ADHD show a constant pattern of inattention and/or hyperactive and impulsive behavior that interferes with normal functioning (American Psychological Association (APA), 2013). Some of the signs of inattention include great difficulty with, and avoidance of, tasks that require sustained attention (such as conversations or reading), failure to follow instructions (often resulting in failure to complete schoolwork and other duties), disorganization (difficulty keeping things in order, poor time management, sloppy and messy work), lack of attention to detail, becoming easily distracted, and forgetfulness. Hyperactivity is characterized by excessive movement, and includes fidgeting or

squirming, leaving one's seat in situations when remaining seated is expected, having trouble sitting still (e.g., in a restaurant), running about and climbing on things, blurting out responses before another person's question or statement has been completed, difficulty waiting one's turn for something, and interrupting and intruding on others. Frequently, the hyperactive child comes across as noisy and boisterous. The child's behavior is hasty, impulsive, and seems to occur without much forethought; these characteristics may explain why adolescents and young adults diagnosed with ADHD receive more traffic tickets and have more automobile accidents than do others their age (Thompson, Molina, Pelham, & Gnagy, 2007).

ADHD occurs in about 5% of children (APA, 2013). On average, boys are 3 times more likely to have ADHD than are girls; however, such findings might reflect the greater propensity of boys to engage in aggressive and antisocial behavior and thus incur a greater likelihood of being referred to psychological clinics (Barkley, 2006). Children with ADHD face severe academic and social challenges. Compared to their non-ADHD counterparts, children with ADHD have lower grades and standardized test scores and higher rates of expulsion, grade retention, and dropping out (Loe & Feldman, 2007). They also are less well-liked and more often rejected by their peers (Hoza et al., 2005).

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Video 3. *Attention Deficit Hyperactivity Disorder* explains the symptoms associated with the three types of ADHD.

Is the prevalence rate of ADHD increasing? Many people believe

that the rates of ADHD have increased in recent years, and there is evidence to support this contention. In a recent study, investigators found that the parent-reported prevalence of ADHD among children (4–17 years old) in the United States increased by 22% during a 4-year period, from 7.8% in 2003 to 9.5% in 2007 (CDC, 2010). ADHD may be over-diagnosed by doctors who are too quick to medicate children as behavior treatment. There is also greater awareness of ADHD now than in the past. Nearly everyone has heard of ADHD, and most parents and teachers are aware of its key symptoms. Thus, parents may be quick to take their children to a doctor if they believe their child possesses these symptoms, or teachers may be more likely now than in the past to notice the symptoms and refer the child for evaluation.

ADHD can persist into adolescence and adulthood (Barkley, Fischer, Smallish, & Fletcher, 2002). A recent study found that 29.3% of adults who had been diagnosed with ADHD decades earlier still showed symptoms (Barbaresi et al., 2013). Somewhat troubling, this study also reported that nearly 81% of those whose ADHD persisted into adulthood had experienced at least one other comorbid disorder, compared to 47% of those whose ADHD did not persist. Additional concerns when an adult has ADHD include worse educational attainment, lower socioeconomic status, less likely to be employed, more likely to be divorced, and more likely to have non-alcohol-related substance abuse problems (Klein et al., 2012).

Family and twin studies indicate that genetics play a significant role in the development of ADHD. Burt (2009), in a review of 26 studies, reported that the median rate of concordance for identical twins was .66, whereas the median concordance rate for fraternal twins was .20. The specific genes involved in ADHD are thought to include at least two that are important in the regulation of the neurotransmitter dopamine (Gizer, Ficks, & Waldman, 2009), suggesting that dopamine may be important in ADHD. Indeed, medications used in the treatment of ADHD, such as methylphenidate (Ritalin) and amphetamine with dextroamphetamine (Adderall), have stimulant qualities and elevate

dopamine activity. People with ADHD show less dopamine activity in key regions of the brain, especially those associated with motivation and reward (Volkow et al., 2009), which provides support to the theory that dopamine deficits may be a vital factor in the development this disorder (Swanson et al., 2007).

Brain imaging studies have shown that children with ADHD exhibit abnormalities in their frontal lobes, an area in which dopamine is in abundance. Compared to children without ADHD, those with ADHD appear to have smaller frontal lobe volume, and they show less frontal lobe activation when performing mental tasks. Recall that one of the functions of the frontal lobes is to inhibit our behavior. Thus, abnormalities in this region may go a long way toward explaining the hyperactive, uncontrolled behavior of ADHD.

Many parents attribute their child's hyperactivity to sugar. A statistical review of 16 studies, however, concluded that sugar consumption has no effect at all on the behavioral and cognitive performance of children (Wolraich, Wilson, & White, 1995). Additionally, although food additives have been shown to increase hyperactivity in non-ADHD children, the effect is rather small (McCann et al., 2007). Numerous studies, however, have shown a significant relationship between exposure to nicotine in cigarette smoke during the prenatal period and ADHD (Linnet et al., 2003). Maternal smoking during pregnancy is associated with the development of more severe symptoms of the disorder (Thakur et al., 2013).

Recommended treatment for ADHD includes behavioral interventions, cognitive behavioral therapy, parent and teacher education, recreational programs, and lifestyle changes, such as getting more sleep (Clay, 2013). For some children, medication is prescribed. Parents are often concerned that stimulant medication may result in their child acquiring a substance use disorder. However, research using longitudinal studies has demonstrated that children diagnosed with ADHD who received pharmacological treatment had a lower risk for substance abuse problems than those

children who did not receive medication (Wilens, Fararone, Biederman, & Gunawardene, 2003). The risk of substance abuse problems appears to be even greater for those with ADHD who are un-medicated and also exhibit antisocial tendencies (Marshal & Molina, 2006).

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Understanding Learning Difficulties

https://vimeo.com/99541247

Video 1. *How Difficult Can This Be? The F.A.T. City Workshop* depicts a series of simulations to help non-learning disabled people understand what it is like to have learning difficulties. Rick Lavoie also provides suggestions for how to help students facing these challenges.

Questions

Below are several questions to help guide your learning while you watch the video.

Introduction

What does F.A.T stand for in this video?

Anxiety

What is a typical reaction humans have when experiencing anxiety? What do we insist kids do when they respond in this way?

Processing

When the teacher asks a question how are mainstream and learning disabled (LD) children different in processing that questions?

Risk-Taking

How do we unintentionally decrease the likelihood of LD students from taking risks?

Visual Perception

Can we motivate LD children to "try harder" when something is too difficult? Why or why not?

Reading Comprehension

Reading comprehension has more to do with _____, not vocabulary!

Effects of Perception on Behavior

Why do LD students often say "I didn't do anything wrong" or "I don't know what I did" when they get into trouble?

Visual-Motor Coordination

How does difficulty with visual-motor integration effect some LD students?

Oral Expression

What is dysnomia? Why are LD students more likely to experience high rates of this?

Reading & Decoding

Children that are able to decode words to read may not be comprehending what is read. What explanation does the video offer for why this happens?

Auditory-Visual Capability

Why do books on tape benefit some LD students?

Fairness

According to the video, what is fairness?

Commentary

What were some of the effects that the participants reported feeling during this simulation? Is this a fair representation as to what LD students may experience?

Academic Achievement

Academic achievement is predicted by interpersonal (e.g., parental engagement in adolescents' education), intrapersonal (e.g., intrinsic motivation), and institutional (e.g., school quality) factors. Academic achievement is important in its own right as a marker of positive adjustment during adolescence but also because academic achievement sets the stage for future educational and occupational opportunities. The most serious consequence of school failure, particularly dropping out of school, is the high risk of unemployment or underemployment in adulthood that follows. High achievement can set the stage for college or future vocational training and opportunities.

Parental Engagement with School

Parents vary in their level of involvement with their children's schools. Teachers often complain that they have difficulty getting parents to participate in their child's education and devise a variety of techniques to keep parents in touch with daily and overall progress. For example, parents may be required to sign a behavior chart each evening to be returned to school or may be given information about the school's events through websites and newsletters. There are other factors that need to be considered when looking at parental involvement. To explore these, first, ask yourself if all parents who enter the school with concerns about their child be received in the same way?

Horvat (2004) found that teachers seek a particular type of involvement from particular types of parents. While teachers thought they were open and neutral in their responses to parental involvement, in reality, teachers were most receptive to support, praise, and agreement coming from parents who were most similar

in race and social class with the teachers. Parents who criticized the school or its policies were less likely to be given a voice. Parents who have higher levels of income, occupational status, and other qualities favored in society have **family capital.** This is a form of power that can be used to improve a child's education. Parents who do not have these qualities may find it more difficult to be effectively involved. The authors suggest that teachers closely examine their biases against parents. Schools may also need to examine their ability to dialogue with parents about school policies in more open ways. Any efforts to improve effective parental involvement should address these concerns.

Motivation to Achieve

Motivation varies and is demonstrated by the kind of goals that students set for themselves, and by how the goals support students' academic achievement. As you might suspect, some goals encourage academic achievement more than others, but even motives that do not concern academics explicitly tend to affect learning indirectly.

What kinds of achievement goals do students hold? Some students' goal may be to learn the material as well as possible because they find it interesting and because they believe it will be useful later—this is a mastery goal because they want primarily to learn or master the material. Other students are concerned less about learning the content than about getting high grades in the course—this is a performance goal because the focus is primarily on looking successful by performing well in the eyes of peers and teachers. There may also be students that are primarily concerned about avoiding a poor or failing mark—this is a performance-avoidance goal because they are not really as concerned about learning or about competitive success but is simply intending to avoid failure.

As you might imagine, mastery, performance, and performance-avoidance goals often are not experienced in pure form, but in combinations. If you play the clarinet in the school band, you might want to improve your technique simply because you enjoy playing as well as possible—essentially a mastery orientation. But you might also want to look talented in the eyes of classmates—a performance orientation. Another part of what you may wish, at least privately, is to avoid looking like a complete failure at playing the clarinet. One of these motives may predominate over the others, but they all may be present.

Mastery goals tend to be associated with the enjoyment of learning the material at hand, and in this sense, represent an outcome that teachers often seek for students. By definition, therefore, they are a form of **intrinsic motivation**. As such, mastery goals have been found to be better than performance goals at sustaining students' interest in a subject. In one review of research about learning goals, for example, students with primarily mastery orientations toward a course they were taking not only tended to express greater interest in the course, but also continued to express interest well beyond the official end of the course, and to enroll in further courses in the same subject (Harackiewicz, et al., 2002; Wolters, 2004).

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Video 1. *Instincts, Arousal, Needs, and Drives: Drive-Reduction and Cognitive Theories* explain some intrinsic motivations.

Performance goals, on the other hand, imply **extrinsic motivation**

and tend to show the mixed effects of this orientation. A positive effect is that students with a performance orientation do tend to get higher grades than those who express primarily a mastery orientation. The advantage in grades occurs both in the short term (with individual assignments) and in the long term (with overall grade point average when graduating). But there is evidence that performance-oriented students do not actually learn the material as deeply or permanently as students who are more mastery-oriented (Midgley, Kaplan, & Middleton, 2001). A possible reason is that measures of performance—such as test scores—often reward relatively shallow memorization of information and therefore guide performance-oriented students away from processing the information thoughtfully or deeply. Another possible reason is that a performance orientation, by focusing on gaining recognition as the best among peers, encourages competition among peers. Giving and receiving help from classmates is thus not in the self-interest of a performance-oriented student, and the resulting isolation limits the student's learning.

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Video 2. *Incentive Theory* explains extrinsic motivation.

As we mentioned, failure-avoidant goals by nature undermine academic achievement. Often they are a negative byproduct of the competitiveness of performance goals (Urdan, 2004). If a teacher (and sometimes also fellow students) put too much emphasis on being the best in the class, and if interest in learning the material as such therefore suffers, then some students may decide that success

is beyond their reach or may not be desirable in any case. The alternative—simply avoiding failure—may seem wiser as well as more feasible. Once a student adopts this attitude, he or she may underachieve more or less deliberately, doing only the minimum work necessary to avoid looking foolish or to avoid serious conflict with the teacher. Avoiding failure in this way is an example of **self-handicapping**—deliberate actions and choices that reduce the chances of success. Students may self-handicap in a number of ways; in addition to not working hard, they may procrastinate about completing assignments, for example, or set goals that are unrealistically high.

Schools

Adolescents spend more waking time in school than in any other context (Eccles & Roeser, 2011). **Secondary education** is traditionally grades 7-12 and denotes the school years after elementary school (known as primary education) and before college or university (known as tertiary education). Adolescents who complete primary education (learning to read and write) and continue on through secondary and tertiary education tend to also have better health, wealth, and family life (Rieff, 1998). Because the average age of puberty has declined over the years, **middle schools** were created for grades 5 or 6 through 8 as a way to distinguish between early adolescence and late adolescence, especially because these adolescents different biologically, cognitively, and emotionally and definitely have different needs.

What Happened to No child Left Behind?

Children's academic performance is often measured with the use of standardized tests. **Achievement tests** are used to measure what a child has already learned. Achievement tests are often used as measures of teaching effectiveness within a school setting and as a method to make schools that receive tax dollars (such as public schools, charter schools, and private schools that receive vouchers) accountable to the government for their performance. In 2001, President Bush signed into effect Public Law 107-110, better known as the **No Child Left Behind Act** mandating that schools administer achievement tests to students and publish those results so that parents have an idea of their children's performance. Additionally, the government would have information on the gaps in educational achievement between children from various social class, racial, and ethnic groups. Schools that showed significant gaps in these levels of performance were mandated to work toward narrowing these gaps. Educators criticized the policy for focusing too much on testing as the only indication of student performance. Target goals were considered unrealistic and set by the federal government rather than individual states. Because these requirements became increasingly unworkable for schools, changes to the law were requested. On December 12, 2015 President Obama signed into law the **Every Student Succeeds Act** (ESSA). This law is state driven and focuses on expanding educational opportunities and improving student outcomes, including in the areas of high school graduation, drop-out rates, and college attendance.

Middle School

Transition to middle school is stressful, and the transition is often complex. When students transition from elementary to middle school, many students are undergoing physical, intellectual, social, emotional, and moral changes (Parker, 2013). Research suggests that early adolescence is an especially sensitive developmental period (McGill et al., 2012). Some students mature faster than others. Students who are developmentally behind typically experience more stress than their counterparts (U.S. Department of Education, 2008). Consequently, they may earn lower grades and display decreased academic motivation, which may increase the rate of dropping out of school (U.S. Department of Education, 2008). For many middle school students, academic achievement slows down, and behavioral problems can increase.

While young adolescents seem to desire independence, they also need protection, security, and structure (Brighton, 2007). Baly, Cornell, & Lovegrove (2014) found that bullying increases in middle school, particularly in the first year. Additionally, unlike elementary school, concerns arise regarding procedural changes. Just when egocentrism is at its height, students are worried about being thrown into an environment of independence and responsibility. They are expected to get to and from classes on their own, manage time wisely, organize and keep up with materials for multiple classes, be responsible for all classwork and homework from multiple teachers, and at the same time develop and maintain a social life (Meece & Eccles, 2010). Students are trying to build new friendships and maintain the ones they already have. As noted throughout this module, peer acceptance is particularly important.

Another aspect to consider is technology. Typically, adolescents get their first cell phone at about age 11, and, simultaneously, they are also expected to research items on the Internet. Social media use and texting increase dramatically, and the research finds both harm and benefits to this use (Coyne et al., 2018).

High School

As adolescents enter high school, their continued cognitive development allows them to think abstractly, analytically, hypothetically, and logically, which is all formal operational thought. High school emphasizes formal thinking in an attempt to prepare graduates for college where analysis is required. Overall, high school graduation rates in the United States have increased steadily over the past decade, reaching 83.2% in 2016 after four years in high school (Gewertz, 2017). Additionally, many students in the United States do attend college. Unfortunately, though, about half of those who go to college leave without a degree (Kena et al., 2016). Those that do earn a degree, however, do make more money and have an easier time finding employment. The key here is understanding adolescent development and supporting teens in making decisions about college or alternatives to college after high school.

High School Dropouts

The **status dropout rate** refers to the percentage of 16 to 24 year-olds who are not enrolled in school and do not have high school credentials (either a diploma or an equivalency credential such as a General Educational Development [GED] certificate). The dropout rate is based on sample surveys of the civilian, noninstitutionalized population, which excludes persons in prisons, persons in the military, and other persons not living in households. The dropout rate among high school students has declined from a rate of 12% in 1990 to 7% in 2013 (U.S. Department of Education, 2015). The rate is lower for Whites than for Blacks, and the rates for both Whites and Blacks are lower than the rate for Hispanics. However, the gap between Whites, Blacks, and Hispanics have narrowed (see Figure 7.2).

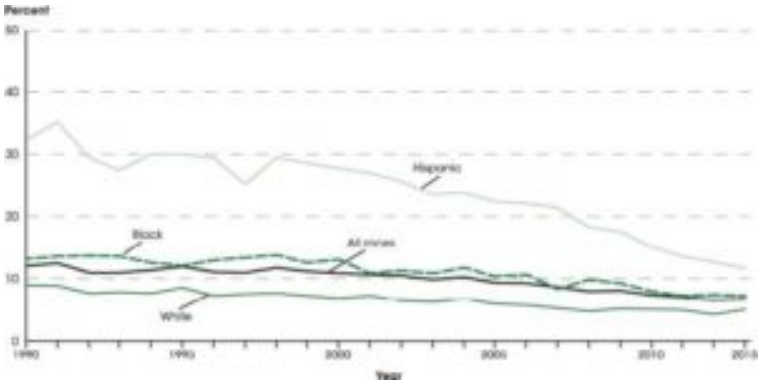

Figure: 7.3.1. Status dropout rates of 16- through 24-year-olds, by race/ethnicity: 1990 through 2013

The dropout rate for males in 1990 was 12%, where it stayed until 2000. Thereafter the rate dropped to 7% in 2013. The dropout rate for females in 1990 was 12%, where it dropped to 10% in 2000, and in 2013 was 6%. From 1997 until 2012, the rate for males was appreciably higher than for females, while in 2013, the gender difference was minimal (U.S. Department of Education, 2015).

Higher Education

College is an important aspect of the lives of many young adults in the United States, with 36% of 18 to 24-year-olds (NCHEMS, 2016b). The rate of college attainment has grown more slowly in the United States than in a number of other nations in recent years (OCED, 2014). This may be due to the fact that the cost of attaining a degree is higher in the U.S. than in many other nations.

As the level of State funding of higher education declines, students are finding that the cost of college is outpacing the rate of inflation, Pell grant increases, and other student scholarships. One

in six students are funding their education through personal loans (TICAS, 2015). With the rising costs of higher education, various news headlines have asked if a college education is worth the cost. One way to address this question is in terms of the earning potential associated with various levels of educational achievement. In 2016, the average earnings for Americans 25 and older with only a high school education was $35,615, compared with $65,482 for those with a bachelor's degree, compared with $92,525 for those with more advanced degrees. Average earnings vary by gender, race, and geographical location in the United States (U.S. Census Bureau, 2017).

Nonetheless, the benefits both to the individual and society outweigh the initial costs. As can be seen in Figure 7.3, those in America with the most advanced degrees earn the highest income and have the lowest unemployment.

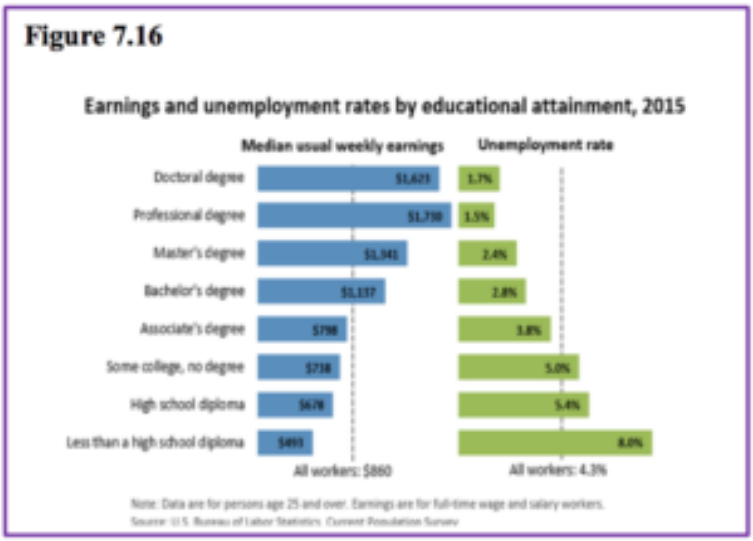

Figure 7.3. Earning and unemployment rate by education attainment, 2015.

Worldwide, over 80% of college-educated adults are employed, compared with just over 70% of those with a high school or equivalent diploma, and only 60% of those with no high school diploma (OECD, 2015). Those with a college degree will earn more over the course of their lifetime. Moreover, the benefits of a college education go beyond employment and finances. The OECD found that around the world, adults with higher educational attainment were more likely to volunteer, felt they had more control over their lives, and thus were more interested in the world around them. Studies of U.S. college students find that they gain a more distinct identity and become more socially competent, less dogmatic, and ethnocentric compared to those not in college (Pascarella, 2006).

Who is Going to College?

Each generation tends to earn (and perhaps need) increased levels of formal education. As we can see in Figure 7.4, approximately one-third of the American adult population has a bachelor's degree or higher, as compared with less than 5% in 1940. Educational attainment rates vary by gender and race. All races combined, women are slightly more likely to have graduated from college than men; that gap widens with graduate and professional degrees. However, wide racial disparities still exist. For example, 23% of African-Americans have a college degree, and only 16.4% of Hispanic Americans have a college degree, compared to 37% of non-Hispanic white Americans. The college graduation rates of African-Americans and Hispanic Americans have been growing in recent years. However, the rate has doubled since 1991 for African-Americans, and it has increased by 60% in the last two decades for Hispanic-Americans.

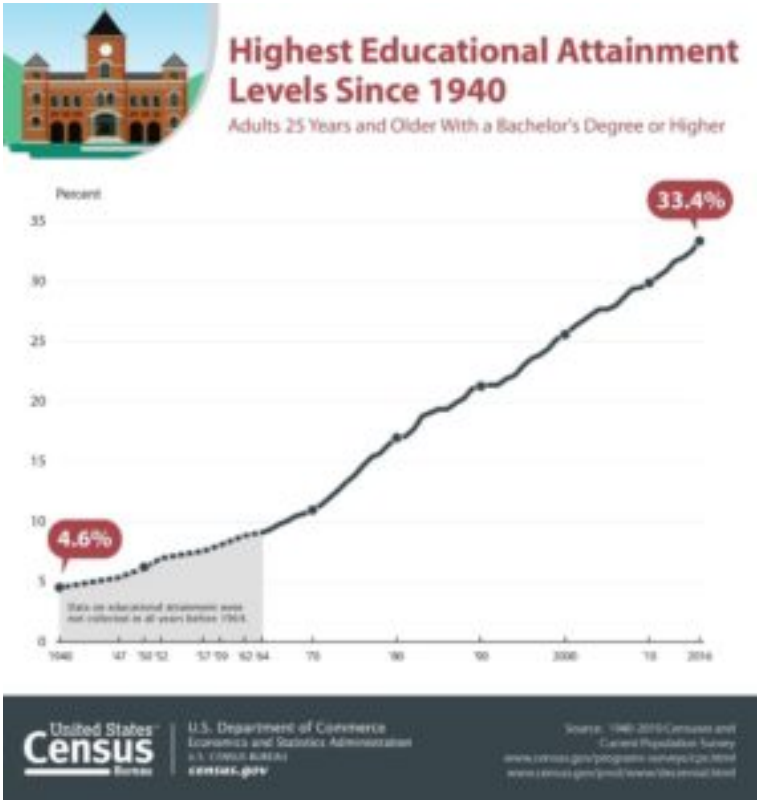

Figure 7.4. Higher education attainment for adults over age 25.

What about those young or emerging adults graduating high school today—is the majority of that group going to college? According to the U.S. Bureau of Labor Statistics (2017), 66.7% of youth ages 16-24 who graduated high school between January and October 2017 were enrolled in colleges or universities in October 2017. There were gender differences (71.7% of females vs. 61.1% of males) and racial differences (83% of Asians, 67.1% of non-Hispanic whites, 61% Hispanics, and 59.4% Blacks). Not all of these students will persist and earn college degrees, however (U.S. Census Bureau, 2017).

Higher Education and Career Preparation

Of concern in recent years is the relationship between higher education and the workplace. In 2005, American educator and then Harvard University President, Derek Bok, called for a closer alignment between the goals of educators and the demands of the economy. Companies outsource much of their work, not only to save costs but to find workers with the skills they need. What is required to do well in today's economy? Colleges and universities, he argued, need to promote global awareness, critical thinking skills, the ability to communicate, moral reasoning, and responsibility in their students. Regional accrediting agencies and state organizations provide similar guidelines for educators. Workers need skills in listening, reading, writing, speaking, global awareness, critical thinking, civility, and computer literacy—all skills that enhance success in the workplace.

More than a decade later, the question remains: does formal education prepare young adults for the workplace? It depends on whom you ask. In an article referring to information from the National Association of Colleges and Employers' 2018 Job Outlook Survey, Bauer-Wolf (2018) explains that employers perceive gaps in students' competencies, but many graduating college seniors are overly confident. The biggest difference was in perceived professionalism and work ethic (only 43% of employers thought that students are competent in this area compared to 90% of the students) (Bauer-Wolf, 2018). Similar differences were also found in terms of oral communication, written communication, and critical thinking skills. Only in terms of digital technology skills were more employers confident about students' competencies than were the students (66% compared to 60%).

It appears that students need to learn what some call "soft skills," as well as the particular knowledge and skills within their college major. As education researcher Loni Bordoloi Pazich (2018) noted, most American college students today are enrolling in business or other pre-professional programs and to be effective and successful

workers and leaders, they would benefit from the communication, teamwork, and critical thinking skills, as well as the content knowledge, gained from liberal arts education (Bordoloi Pazich, 2018). In fact, two-thirds of children starting primary school now will be employed in jobs in the future that currently do not exist. Therefore, students cannot learn every single skill or fact that they may need to know, but they can learn how to learn, think, research, and communicate well so that they are prepared to continually learn new things and adapt effectively in their careers and lives since the economy, technology, and global markets will continue to evolve (Henseler, 2017).

Glossary

adolescent egocentrism: a characteristic of adolescent thinking that leads young people (ages 10-13) to focus on themselves to the exclusion of others (according to David Elkind)

accommodation: when we restructure or modify what we already know so that new information can fit in better

analytic thought: thought that results from analysis, such as a systematic ranking of pros and cons, risks and consequences, possibilities and facts. Analytic thought depends on logic and rationality

animism: the belief that inanimate objects are capable of actions and have lifelike qualities

artificialism: the belief that environmental characteristics can be attributed to human actions or interventions

assimilation: when we modify or change new information to fit into our schemas (what we already know)

attention deficit hyperactivity disorder: a neurological and behavioral disorder in which a person has difficulty staying on task, screening out distractions, and inhibiting behavioral outbursts

autism or autism spectrum disorder: a developmental disorder that affects communication and behavior

babbling: an infant's repetition of certain syllables, such as ba-ba-ba, that begins when babies are between 6 and 9 months old

behavioral decision-making theory: proposes that adolescents and adults both weigh the potential rewards and consequences of an action. However, research has shown that adolescents seem to give more weight to rewards, particularly social rewards, than do adults

centration: the act of focusing all attention on one characteristic or dimension of a situation, while disregarding all others

classification: the arrangement of information into categories or classes

concrete operational stage of cognitive development: Piaget's stage of development during middle childhood that emphasizes the use of logical thought, especially as applied to concrete, or physical objects

constructivist perspective: based on the work of Piaget, a quantitative, stage-theory approach. This view hypothesizes that adolescents' cognitive improvement is relatively sudden and drastic, as people learn by acting on their environment and they actively construct knowledge

deductive reasoning: reasoning from a general statement, premise, or principle, though logical steps to figure out (deduce) specifics. Also called top-down processing

divided attention: the ability to pay attention to two or more stimuli at the same time; this ability improves during adolescence

dual process model/dual processing: the notion that two networks exist within the human brain, one for emotional processing of stimuli and one for analytic reasoning

dyslexia: a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities

ecological systems model: Brofenbrenner's theory that we all belong to many communities and are influenced in the context of multiple environments, also known as ecological systems; organized into five levels of external influence: microsystem, mesosystem, exosystem, macrosystem and chronosystem

egocentrism: the tendency of young children to think that everyone sees things in the same way as the child

fast-mapping: a word-learning process in which new words are rapidly learned by making connections between new words and concepts already known

formal operational thought: the fourth and final stage of Piaget's theory of cognitive development, characterized by more systematic logical thinking and by the ability to understand and systematically manipulate abstract concepts

hidden curriculum: cultural values, concepts, behaviors and roles

that are part of the school experience but are not part of the formal curriculum

holophrase: a single word that is used to express a complete, meaningful thought

home state: occurs when parents or siblings visit the school. Children in this state may enjoy special privileges such as going home early or being exempt from certain school rules in the mother's presence, or it can be difficult if the parent is there to discuss trouble at school with a staff member

hypothetical thought: reasoning that includes propositions and possibilities that may not reflect reality

identity: the understanding that objects have an identity or qualities that do not change even if the object is altered in some way

infantile or childhood amnesia: the idea that people forget everything that happened to them before the age of 3

information-processing perspective: derives from the study of artificial intelligence and explains cognitive development in terms of the growth of specific components of the overall process of thinking

intuitive thought: thoughts that arise from an emotion or a hunch, beyond rational explanation, and are influenced by past experiences and cultural assumptions

invincibility fable: an adolescent's egocentric conviction that he or she cannot be overcome or even harmed by anything that might defeat a normal mortal, such as unprotected sex, drug abuse, or high-speed driving

irreversibility: when a person is unable to reverse a sequence of events mentally

imaginary audience: the other people who, in an adolescent's egocentric belief, are watching and taking note of his or her appearance, ideas, and behavior. This belief makes many adolescents very self-conscious

language acquisition device (LAD): Chomsky's term for the hypothesized mental structure that enables humans to learn the language, including the basic aspects of grammar, vocabulary, and intonation

long-term memory: the third component of the memory system where information is stored for long periods of time

metacognition: refers to "thinking about thinking," and it is relevant in social cognition and results in increased introspection, self-consciousness, and intellectualization during adolescence

middle school: a school for children in the grades between elementary school and high school. Middle school usually begins with grade 6 and ends with grade 8

mnemonic devices: mental strategies to help learn and remember information more efficiently; improves during adolescence

morpheme: the smallest unit of language that conveys some type of meaning

naming explosion: a sudden increase in an infant's vocabulary, especially in the number of nouns, that begins at about 18 months of age

object permanence: the realization that objects (including people) still exist even if they can no longer be seen, touched, or heard

operations: the term used by Piaget to mean the logical rules that children develop with time

overregulation: a process in learning a language in which children overgeneralize rules to words where the rule is not applicable

personal fable: an aspect of adolescent egocentrism characterized by an adolescent's belief that his or her thoughts, feelings, and experiences are unique, more wonderful, or more awful than anyone else's

phoneme: a basic sound unit of a given language

preoperational stage: the second stage in Piaget's theory of cognitive development; describes the development in children ages 2-7

primary circular reactions: the first two stages of Piaget's sensorimotor intelligence which involve the infant's responses to its own body

private speech: speech that a child says aloud, but which is not meant to be part of communication with anyone else

reciprocity: the understanding that changing one quality of an

object can be compensated for by changes in another quality of that object

relativistic thinking: thinking that understands the relative or situational nature of circumstances

reversibility: the understanding that some things that have been changed can be returned to their original state

sanctity state: a time in which the child is contemplative, quiet, or prayerful. It is often only a very brief part of the day

schema: a set of linked mental representations of the world, which we use both to understand and to respond to situations

secondary circular reactions: stages 3 and 4 of Piaget's sensorimotor intelligence, which involves the infant's responses to objects and people

secondary education: the period after primary education (elementary or grade school) and before tertiary education (college). It usually occurs from about ages 12 to 18, although there is some variation by school and by nation

selective attention: the process by which one focuses on one stimulus while tuning out another; this ability improves during adolescence

self-fulfilling prophecy: the tendency to act in a way that makes what you predict will happen come true

sensorimotor intelligence: Piaget's term for the way infants think (by using their senses and motor skills) during the first stage of cognitive development

sensory memory: the first component of the memory system where information comes in through the 5 senses and is processed if the mind believes that the information is important

street corner state: state in which the child is playful, energetic, excited, and expresses personal opinions, feelings, and beliefs

student state: this state is one in which the student focuses on a task or tries to stay focused on a task, is passive, compliant, and often frustrated

syncretism: the tendency to think that if two events occur simultaneously, one caused the other

tertiary circular reactions: consist of actions (stage 5) and ideas (stage 6) where infants become more creative in their thinking

theory of mind: the understanding that the mind holds people's beliefs, desires, emotions, and intentions. One component of this is understanding that the mind can be tricked or that the mind is not always accurate

theory of multiple intelligences: Garner's theory that there are many kinds of intelligence. The modern version of the theory recognizes 9 forms of intelligence

transductive reasoning: a failure in understanding cause and effect relationships which happens when a child reasons from specific to specific; drawing a relationship between two separate events that are otherwise unrelated

triarchic theory of intelligence: Sternberg's theory that recognizes three forms of intelligence: academic, creative, and practical

working memory: the second component of the memory system where information that has been processed in sensory memory goes. Working memory includes all the information that you are consciously aware of

zone of proximal development: the range of material that a child is ready to learn if proper support and guidance are given from either a peer who understands the material or by an adult

PSYCHOSOCIAL DEVELOPMENT IN INFANCY THROUGH ADOLESCENCE

Learning outcomes

- Describe emotional development and self-awareness during infancy
- Contrast styles of attachment
- Describe temperament and the goodness-of-fit model
- Describe the development of a self-concept and identity development during childhood
- Describe domains of identity development
- Explain Freud's psychodynamic theory as it applies to early childhood
- Explain Erikson's psychosocial theory as it applies to child development
- Explain Marcia's four identity statuses
- Examine concerns about childhood stress and trauma
- Describe the impact of different parenting styles on children's development
- Apply principles of operant conditioning to parenting and behavior modification
- Describe the importance of peer relationships to

children and adolescent as they apply to development
- Explain the role that aggression, anxiety, and depression play in adolescent development
- Understand Kohlberg's theory of moral development

Psychosocial development occurs as children form relationships, interact with others, and understand and manage their feelings. In emotional and social development, forming healthy attachments is very important and is the major social milestone of infancy. Attachment is a long-standing connection or bond with others. Developmental psychologists are interested in how infants reach this milestone. They ask such questions as: how do parent and infant attachment bonds form? How does neglect affect these bonds? What accounts for children's attachment differences?

The time between a child's second and sixth birthdays is full of new social experiences. At the beginning of this stage, a child selfishly engages in the world—the goal is to please the self. As the child gets older, they realize that relationships built on give-and-take. They start to learn to empathize with others. They learn to make friends. Learning to navigate the social sphere is not easy, but children do it readily.

While the child is learning about their place in various relationships, they are also developing an understanding of emotion. A two-year-old does not have a good grasp on their emotions, but by the time a child is six, they understand their emotions better. They also understand how to control their emotions—even to the point that they may put on a different emotion than they are actually feeling. Further, by the time a child is six years old, they understand that other people have emotions and that all of the emotions involved in a situation (theirs and other people's) should be taken into consideration. That said, although

the six-year-old understands these things, they are not always good at putting the knowledge into action. We'll examine some of these issues in this section.

Children in middle childhood are starting to make friends in more sophisticated ways. They are choosing friends for specific characteristics, including shared interests, sense of humor, and being a good person. That is quite a departure from the earlier days of playing with the people in your group just because they are there. Children in middle childhood are starting to realize that there are benefits to friendships, and there are sometimes difficulties as well. In this section, we'll examine some aspects of these relationships.

Adolescence is a period of personal and social identity formation, in which different roles, behaviors, and ideologies are explored. In the United States, adolescence is seen as a time to develop independence from parents while remaining connected to them. Some key points related to social development during adolescence include the following:

- Adolescence is the period of life known for the formation of personal and social identity.
- Adolescents must explore, test limits, become autonomous, and commit to an identity, or sense of self.
- Erik Erikson referred to the task of the adolescent as one of identity versus role confusion. Thus, in Erikson's view, an adolescent's main questions are "Who am I?" and "Who do I want to be?"
- Early in adolescence, cognitive developments result in greater self-awareness, the ability to think about abstract, future possibilities, and the ability to consider multiple possibilities and identities at once.
- Changes in the levels of certain neurotransmitters (such as dopamine and serotonin) influence the way in which adolescents experience emotions, typically making them more emotional and more sensitive to stress.
- When adolescents have advanced cognitive development and

maturity, they tend to resolve identity issues more easily than peers who are less cognitively developed.
- As adolescents work to form their identities, they pull away from their parents, and the peer group becomes very important; despite this, relationships with parents still play a significant role in identity formation.

Emotional Development

At birth, infants exhibit two emotional responses: attraction and withdrawal. They show attraction to pleasant situations that bring comfort, stimulation, and pleasure. And they withdraw from unpleasant stimulation such as bitter flavors or physical discomfort. At around two months, infants exhibit social engagement in the form of **social smiling** as they respond with smiles to those who engage their positive attention. Pleasure is expressed as laughter at 3 to 5 months of age, and displeasure becomes more specific to fear, sadness, or anger (usually triggered by frustration) between ages 6 and 8 months. Where anger is a healthy response to frustration, sadness, which appears in the first months as well, usually indicates withdrawal (Thiam et al., 2017).

As reviewed above, infants progress from reactive pain and pleasure to complex patterns of socioemotional awareness, which is a transition from basic instincts to learned responses. Fear is not always focused on things and events; it can also involve social responses and relationships. The fear is often associated with the presence of strangers or the departure of significant others known respectively as **stranger wariness** and **separation anxiety**, which appear sometime between 6 and 15 months. And there is even some indication that infants may experience jealousy as young as 6 months of age (Hart & Carrington, 2002).

Stranger wariness actually indicates that brain development and increased cognitive abilities have taken place. As an infant's memory develops, they are able to separate the people that they know from the people that they do not. The same cognitive advances allow infants to respond positively to familiar people and recognize those that are not familiar. **Separation anxiety** also indicates cognitive advances and is universal across cultures. Due to the infant's increased cognitive skills, they are able to ask reasonable questions like "Where is my caregiver going?" "Why are they leaving?" or

"Will they come back?" Separation anxiety usually begins around 7-8 months and peaks around 14 months, and then decreases. Both stranger wariness and separation anxiety represent important social progress because they not only reflect cognitive advances but also growing social and emotional bonds between infants and their caregivers.

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As we will learn through the rest of this module, caregiving does matter in terms of infant emotional development and emotional regulation. **Emotional regulation** can be defined by two components: emotions as regulating and emotions as regulated. The first, "emotions as regulating," refers to changes that are elicited by activated emotions (e.g., a child's sadness eliciting a change in parent response). The second component is labeled "emotions as regulated," which refers to the process through which the activated emotion is itself changed by deliberate actions taken by the self (e.g., self-soothing, distraction) or others (e.g., comfort).

Throughout infancy, children rely heavily on their caregivers for emotional regulation; this reliance is labeled co-regulation, as parents and children both modify their reactions to the other based on the cues from the other. Caregivers use strategies such as distraction and sensory input (e.g., rocking, stroking) to regulate infants' emotions. Despite their reliance on caregivers to change the intensity, duration, and frequency of emotions, infants are capable of engaging in self-regulation strategies as young as 4 months old. At this age, infants intentionally avert their gaze from

overstimulating stimuli. By 12 months, infants use their mobility in walking and crawling to intentionally approach or withdraw from stimuli.

Throughout toddlerhood, caregivers remain important for the emotional development and socialization of their children, through behaviors such as labeling their child's emotions, prompting thought about emotion (e.g., "why is the turtle sad?"), continuing to provide alternative activities/distractions, suggesting coping strategies, and modeling coping strategies. Caregivers who use such strategies and respond sensitively to children's emotions tend to have children who are more effective at emotion regulation, are less fearful and fussy, more likely to express positive emotions, easier to soothe, more engaged in environmental exploration, and have enhanced social skills in the toddler and preschool years.

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Attachment

Psychosocial development occurs as children form relationships, interact with others, and understand and manage their feelings. In social and emotional development, forming healthy attachments is very important and is the major social milestone of infancy. **Attachment** is a long-standing connection or bond with others. Developmental psychologists are interested in how infants reach this milestone. They ask such questions as: How do parent and infant attachment bonds form? How does neglect affect these bonds? What accounts for children's attachment differences?

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Early Attachment Research

Researchers Harry Harlow, John Bowlby, and Mary Ainsworth conducted studies designed to answer these questions. In the 1950s, Harlow conducted a series of experiments on monkeys. He separated newborn monkeys from their mothers. Each monkey was presented with two surrogate mothers. One surrogate mother was made out of wire mesh, and she could dispense milk. The other surrogate mother was softer and made from cloth: This monkey did not dispense milk. Research shows that the monkeys preferred the soft, cuddly cloth monkey, even though she did not provide

any nourishment. The baby monkeys spent their time clinging to the cloth monkey and only went to the wire monkey when they needed to be feed. Prior to this study, the medical and scientific communities generally thought that babies become attached to the people who provide their nourishment. However, Harlow (1958) concluded that there was more to the mother-child bond than nourishment. Feelings of comfort and security are the critical components of maternal-infant bonding, which leads to healthy psychosocial development.

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Video 1. *Harlow's Studies on Dependency in Monkeys.*

Building on the work of Harlow and others, John Bowlby developed the concept of attachment theory. He defined attachment as the affectional bond or tie that an infant forms with the mother (Bowlby, 1969). He believed that an infant must form this bond with a primary caregiver in order to have normal social and emotional development. In addition, Bowlby proposed that this attachment bond is very powerful and continues throughout life. He used the concept of a secure base to define a healthy attachment between parent and child (1988). A **secure base** is a parental presence that gives children a sense of safety as they explore their surroundings. Bowlby said that two things are needed for a healthy attachment: The caregiver must be responsive to the child's physical, social, and emotional needs; and the caregiver and child must engage in mutually enjoyable interactions (Bowlby, 1969).

Ainsworth's Strange Situation

While Bowlby thought attachment was an all-or-nothing process, Mary Ainsworth's (1970) research showed otherwise. Ainsworth wanted to know if children differ in the ways they bond, and if so, how. To find the answers, she used the **Strange Situation** procedure to study attachment between mothers and their infants (1970). In the Strange Situation, the mother (or primary caregiver) and the infant (age 12-18 months) are placed in a room together. There are toys in the room, and the caregiver and child spend some time alone in the room. After the child has had time to explore their surroundings, a stranger enters the room. The mother then leaves her baby with the stranger. After a few minutes, she returns to comfort her child.

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Video 2. *Secure and Insecure Attachment.*

Types of Attachment

Based on how the toddlers responded to the separation and reunion, Ainsworth identified three types of parent-child attachments: secure, avoidant, and resistant (Ainsworth & Bell, 1970). A fourth style, known as disorganized attachment, was later described (Main & Solomon, 1990).

Secure Attachment

The most common type of attachment—also considered the healthiest—is called **secure attachment**. The secure child feels confident that their needs will be met in a timely and consistent way. The child prefers their caregivers over others. A young child will use the caregiver as the base for exploration, providing assurance and enabling discovery. In the Strange Situation, securely attached children were distressed when their caregivers left the room, but when their caregivers returned, the securely attached children were happy to see them.

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Securely attached children have caregivers who are sensitive and responsive to their needs. in North America, this interaction may include an emotional connection in addition to adequate care. However, even in cultures where mothers do not talk, cuddle, and play with their infants, secure attachments can develop (LeVine et. al., 1994). Secure attachments can form provided the child has consistent contact and care from one or more caregivers. Consistency of contacts may be jeopardized if the infant is cared for in a daycare with a high turn-over of caregivers or if institutionalized and given little more than basic physical care. And while infants who, perhaps because of being in orphanages with inadequate care, have not had the opportunity to attach in infancy can form initial secure attachments several years later, they may

have more emotional problems of depression or anger, or be overly friendly as they make adjustments (O'Connor et. al., 2003).

Watch It

Video 3. This video demonstrates Ainsworth's protocol for assessing the quality of a child's attachment to their caregiver and the typical response of a securely attached child.

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Avoidant Attachment

With **avoidant attachment,** a style marked by insecurity, is characterized by a tendency to avoid contact with the caregiver and with others. This child may have learned that needs typically go unmet and learns that the caregiver does not provide care and cannot be relied upon for comfort, even sporadically. An insecure-avoidant child learns to be more independent and disengaged. Such a child might sit passively in a room filled with toys until it is time to go.

During the Strange Situation, the child is unresponsive to the parent, does not use the parent as a secure base, and does not care if the parent leaves. The toddler reacts to the parent the same way they react to a stranger. When the parent does return, the child is slow to show a positive reaction. Ainsworth theorized that these children were most likely to have a caregiver who was insensitive and inattentive to their needs (Ainsworth, Blehar, Waters, & Wall, 1978).

Watch It

Video 4. This video depicts a child with the avoidant attachment style.

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Anxious-Ambivalent Attachment

The **anxious-ambivalent attachment** is another insecure syle. These children tend to show clingy behavior and are hesitant to engage in activities or play aware from the caregiver. It is as if the child fears that the caregiver will abandon them and clings accordingly. The child may cry if separated from the caregiver and also cry upon their return. They seek constant reassurance that never seems to satisfy their doubt. This type of insecure attachment might be a result of not having their needs met in a consistent or timely way. Consequently, the infant is never sure that the world is a trustworthy place or that he or she can rely on others without some anxiety. A caregiver who is unavailable, perhaps because of marital tension, substance abuse, or preoccupation with work, may send a

message to the infant they cannot rely on having their needs met. A caregiver who attends to a child's frustration can help teach them to be calm and to relax. But an infant who receives only sporadic attention when experiencing discomfort may not learn how to calm down.

During the Strange Situations, these children do not explore the toys in the room, appearing too fearful. When the caregiver leaves, the child becomes extremely disturbed and angry with the parent. Furthermore, when the caregiver returns, the children are difficult to comfort. Resistant attachment is thought to be the result of the caregivers' inconsistent level of response to their child (Ainsworth & Bell, 1970).

Watch It

Video 5. The final segment of this video demonstrates the behavior of a child with an anxious-ambivalent attachment style.

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Disorganized-Disorientated Attachment

Finally, the **disorganized-disorganized attachment** represents the most insecure style of attachment and occurs when the child is given mixed, confused, and inappropriate responses from the caregiver. For example, a mother who suffers from schizophrenia may laugh when a child is hurting or cry when a child exhibits joy. The child does not learn how to interpret emotions or to connect with the unpredictable caregiver. This type of attachment is seen most often in kids who have been abused or severely neglected. Research has shown that abuse disrupts a child's ability to regulate their emotions. These children behaved oddly in the Strange Situation. They freeze, run around the room in an erratic manner, or try to run away when the caregiver returns (Main & Solomon, 1990) and their behavior tends to be unpredictable in response to the protocol.

How common are the attachment styles among children in the United States? It is estimated that about 65 percent of children in the United States are securely attached. Twenty percent exhibit avoidant styles and 10 to 15 percent are resistant. Another 5 to 10 percent may be characterized as disorganized.

Influences on Attachment Formation

While Ainsworth's research has found support in subsequent studies, it has also met criticism. Some researchers have pointed out that a child's **temperament** (which we discuss next) may have a strong influence on attachment (Gervai, 2009; Harris, 2009), and others have noted that attachment varies from culture to culture, a factor that was not accounted for in Ainsworth's research (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000; van Ijzendoorn & Sagi-Schwartz, 2008).

Attachment styles vary in the amount of security and closeness felt in the relationship and they can change with new experiences. The type of attachment fostered in parenting styles varies by culture as well. For example, German parents value independence and Japanese mothers are typically by their children's sides. As a result, the rate of insecure-avoidant attachments is higher in Germany and insecure-resistant attachments are higher in Japan. These differences reflect cultural variation rather than true insecurity, however (van Ijzendoorn and Sagi, 1999). Keep in mind that methods for measuring attachment styles have been based on a model that reflects middle-class, US values and interpretation. Newer methods for assessing attachment styles involve using a Q-sort technique in which a large number of behaviors are recorded on cards and the observer sorts the cards in a way that reflects the type of behavior that occurs within the situation.

Temperament

Perhaps you have spent time with a number of infants. How were they alike? How did they differ? Or compare yourself with your siblings or other children you have known well. You may have noticed that some seemed to be in a better mood than others and that some were more sensitive to noise or more easily distracted than others. These differences may be attributed to temperament. **Temperament** is an inborn quality noticeable soon after birth. Temperament is not the same as personality but may lead to personality differences. Generally, personality traits are learned, whereas temperament is genetic. Of course, for every trait, nature and nurture interact.

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Video 1. *Temperament, Heredity, and Genes.*

According to Chess and Thomas (1996), children vary on nine dimensions of temperament. These include activity level, regularity (or predictability), sensitivity thresholds, mood, persistence or distractibility, among others. These categories include the following:

1. Activity level. Does the child display mostly active or inactive states?
2. Rhythmicity or Regularity. Is the child predictable or unpredictable regarding sleeping, eating, and elimination

patterns?

3. Approach-Withdrawal. Does the child react or respond positively or negatively to a newly encountered situation?
4. Adaptability. Does the child adjust to unfamiliar circumstances easily or with difficulty?
5. Responsiveness. Does it take a small or large amount of stimulation to elicit a response (e.g., laughter, fear, pain) from the child?
6. Reaction Intensity. Does the child show low or high energy when reacting to stimuli?
7. Mood Quality. Is the child normally happy and pleasant, or unhappy and unpleasant?
8. Distractibility. Is the child's attention easily diverted from a task by external stimuli?
9. Persistence and Attention Span. Persistence – How long will the child continue at an activity despite difficulty or interruptions? Attention span – For how long a period of time can the child maintain interest in an activity?

The New York Longitudinal Study was a long-term study of infants, on these dimensions, which began in the 1950s. Most children do not have their temperament clinically measured, but categories of temperament have been developed and are seen as useful in understanding and working with children. Based on this study, babies can be described according to one of several profiles: easy or flexible (40%), slow to warm up or cautious (15%), difficult or feisty (10%), and undifferentiated, or those who can't easily be categorized (35%).

Easy babies (40% of infants) have a positive disposition. Their body functions operate regularly and they are adaptable. They are generally positive, showing curiosity about new situations and their emotions are moderate or low in intensity. Difficult babies (10%

of infants) have more negative moods and are slow to adapt to new situations. When confronted with a new situation, they tend to withdraw. Slow-to-warm babies (15% of infants) are inactive, showing relatively calm reactions to their environment. Their moods are generally negative, and they withdraw from new situations, adapting slowly. The undifferentiated (35%) could not be consistently categorized. These children show a variety of combinations of characteristics. For example, an infant may have an overall positive mood but react negatively to new situations.

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No single type of temperament is invariably good or bad, however, infants with difficult temperaments are more likely than other babies to develop emotional problems, especially if their mothers were depressed or anxious caregivers (Garthus-Niegel et al., 2017). Children's long-term adjustment actually depends on the **goodness-of-fit** of their particular temperament to the nature and demands of the environment in which they find themselves. Therefore, what appears to be more important than child temperament is how caregivers respond to it.

Think about how you might approach each type of child in order to improve your interactions with them. An easy or flexible child will not need much extra attention unless you want to find out whether they are having difficulties that have gone unmentioned. A slow-to-warm-up child may need to be given advance warning if new people or situations are going to be introduced. A difficult or feisty child may need to be given extra time to burn off their

energy. A caregiver's ability to accurately read and work well with the child will enjoy this **goodness-of-fit,** meaning their styles match, and communication and interaction can flow. The temperamentally active children can do well with parents who support their curiosity but could have problems in a more rigid family.

It is this goodness-of-fit between child temperament and parental demands and expectations that can cause struggles. Rather than believing that discipline alone will bring about improvements in children's behavior, our knowledge of temperament may help a parent, teacher, or other caregiver gain insight to work more effectively with a child. Viewing temperamental differences as varying styles that can be responded to accordingly, as opposed to 'good' or 'bad' behavior. For example, a persistent child may be difficult to distract from forbidden things such as electrical cords, but this persistence may serve her well in other areas such as problem-solving. Positive traits can be enhanced and negative traits can be subdued. The child's style of reaction, however, is unlikely to change. Temperament doesn't change dramatically as we grow up, but we may learn how to work around and manage our temperamental qualities. Temperament may be one of the things about us that stays the same throughout development.

Link to Learning

Read the article "Lasting Effects of a Goodness- or Poorness-of-fit" from Psychology Today to learn more about goodness-of-fit and poorness-of-fit.

Development of Self

Self-Awareness

During the second year of life, children begin to recognize themselves as they gain a sense of the self as an object. The realization that one's body, mind, and activities are distinct from those of other people is known as **self-awareness** (Kopp, 2011). The most common technique used in research for testing self-awareness in infants is a mirror test known as the "Rouge Test." The rouge test works by applying a dot of rouge (colored makeup) on an infant's face and then placing them in front of the mirror. If the infant investigates the dot on their nose by touching it, they are thought to realize their own existence and have achieved self-awareness. A number of research studies have used this technique and shown self-awareness to develop between 15 and 24 months of age. Some researchers also take language such as "I, me, my, etc." as an indicator of self-awareness.

Cognitive psychologist Philippe Rochat (2003) described a more in-depth developmental path in acquiring self-awareness through various stages. He described self-awareness as occurring in five stages beginning from birth.

Table 1. Stages of acquiring self-awareness

Stage	Description
Stage 1 – Differentiation (from birth)	Right from birth infants are able to differentiate the self from the non-self. A study using the infant rooting reflex found that infants rooted significantly less from self-stimulation, contrary to when the stimulation came from the experimenter.
Stage 2 – Situation (by 2 months)	In addition to differentiation, infants at this stage can also situate themselves in relation to a model. In one experiment infants were able to imitate tongue orientation from an adult model. Additionally, another sign of differentiation is when infants bring themselves into contact with objects by reaching for them.
Stage 3 – Identification (by 2 years)	At this stage, the more common definition of "self-awareness" comes into play, where infants can identify themselves in a mirror through the "rouge test" as well as begin to use language to refer to themselves.
Stage 4 – Permanence	This stage occurs after infancy when children are aware that their sense of self continues to exist across both time and space.
Stage 5 – Self-consciousness or meta-self-awareness	This also occurs after infancy. This is the final stage when children can see themselves in 3rd person, or how they are perceived by others.

Once a child has achieved self-awareness, the child is moving toward understanding social emotions such as guilt, shame or embarrassment, and pride, as well as sympathy and empathy. These will require an understanding of the mental state of others which is acquired around age 3 to 5 and will be explored in the next module (Berk, 2007).

Watch It

Video 1. This video shows one study that demonstrates how toddlers become self-aware around 18 months.

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Developing a Concept of Self

Early childhood is a time of forming an initial sense of self. A **self-concept** or idea of who we are, what we are capable of doing, and how we think and feel is a social process that involves taking into

consideration how others view us. It might be said, then, that in order to develop a sense of self, you must have interaction with others. Interactionist theorists, Cooley and Mead offer two interesting explanations of how a sense of self develops.

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Video 2. *Self-Concept, Self-Identity, and Social Identity* explains the various types of self and the formation of identity.

Cooley's Looking-Glass Self

Charles Horton Cooley (1964) suggested that our self-concept comes from looking at how others respond to us. This process, known as the looking-glass self involves looking at how others seem to view us and interpreting this as we make judgments about whether we are good or bad, strong or weak, beautiful or ugly, and so on. Of course, we do not always interpret their responses accurately so our self-concept is not simply a mirror reflection of the views of others. After forming an initial self-concept, we may use our existing self-concept as a mental filter screening out those responses that do not seem to fit our ideas of who we are. So compliments may be negated, for example.

Think of times in your life when you felt more self-conscious. The process of the looking-glass self is pronounced when we are preschoolers. Later in life, we also experience this

process when we are in a new school, new job, or are taking on a new role in our personal lives and are trying to gauge our own performance. When we feel more sure of who we are we focus less on how we appear to others.

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Video 3. *Charles Cooley–Looking Glass Self* explains more about this theory.

Mead's I and Me

George Herbert Mead (1967) offered an explanation of how we develop a social sense of self by being able to see ourselves through the eyes of others. There are two parts of the self: the "I" which is the part of the self that is spontaneous, creative, innate, and is not concerned with how others view us and the "me" or the social definition of who we are.

When we are born, we are all "I" and act without concern about how others view us. But the socialized self begins when we are able to consider how one important person views us. This initial stage is called "taking the role of the significant other." For example, a child may pull a cat's tail and be told by his mother, "No! Don't do that, that's bad" while receiving a slight slap on the hand. Later, the child may mimic the same behavior toward the self and say aloud, "No, that's bad" while patting his own hand. What has

happened? The child is able to see himself through the eyes of the mother. As the child grows and is exposed to many situations and rules of culture, he begins to view the self in the eyes of many others through these cultural norms or rules. This is referred to as "taking the role of the generalized other" and results in a sense of self with many dimensions. The child comes to have a sense of self as a student, as a friend, as a son, and so on.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=103#oembed-3

Video 4. *George Herbert Mead–The I and the Me* explains more about this theory.

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Exaggerated Sense of Self

One of the ways to gain a clearer sense of self is to exaggerate those qualities that are to be incorporated into the self. Preschoolers often like to exaggerate their own qualities or to seek validation as

the biggest or smartest or child who can jump the highest. Much of this may be due to the simple fact that the child does not understand their own limits. Young children may really believe that they can beat their parent to the mailbox, or pick up the refrigerator.

This exaggeration tends to be replaced by a more realistic sense of self in middle childhood as children realize that they do have limitations. Part of this process includes having parents who allow children to explore their capabilities and give the child authentic feedback. Another important part of this process involves the child learning that other people have capabilities, too and that the child's capabilities may differ from those of other people. Children learn to compare themselves to others to understand what they are "good at" and what they are not as good at.

Children in middle childhood have a more realistic sense of self than do those in early childhood. That exaggerated sense of self as "biggest" or "smartest" or "tallest" gives way to an understanding of one's strengths and weaknesses. This can be attributed to greater experience in comparing one's own performance with that of others and to greater cognitive flexibility. A child's self-concept can be influenced by peers, family, teachers, and the messages they send about a child's worth. Contemporary children also receive messages from the media about how they should look and act. Movies, music videos, the internet, and advertisers can all create cultural images of what is desirable or undesirable and this too can influence a child's self-concept.

Self-Efficacy

Imagine two students, Sally and Lucy, who are about to take the same math test. Sally and Lucy have the same exact ability to do well in math, the same level of intelligence, and the same motivation to do well on the test. They also studied together. They even have

the same brand of shoes on. The only difference between the two is that Sally is very confident in her mathematical and her test-taking abilities, while Lucy is not. So, who is likely to do better on the test? Sally, of course, because she has the confidence to use her mathematical and test-taking abilities to deal with challenging math problems and to accomplish goals that are important to her—in this case, doing well on the test. This difference between Sally and Lucy—the student who got the A and the student who got the B-, respectively—is self-efficacy. Self-efficacy influences behavior and emotions in particular ways that help people better manage challenges and achieve valued goals.

A concept that was first introduced by Albert Bandura in 1977, **self-efficacy** refers to a person's belief that he or she is able to effectively perform the tasks needed to attain a valued goal (Bandura, 1977). Since then, self-efficacy has become one of the most thoroughly researched concepts in psychology. Just about every important domain of human behavior has been investigated using self-efficacy theory (Bandura, 1997; Maddux, 1995; Maddux & Gosselin, 2011, 2012). Self-efficacy does not refer to your abilities but rather to your beliefs about what you can do with your abilities. Also, self-efficacy is not a trait—there are not certain types of people with high self-efficacies and others with low self-efficacies (Stajkovic & Luthans, 1998). Rather, people have self-efficacy beliefs about specific goals and life domains. For example, if you believe that you have the skills necessary to do well in school and believe you can use those skills to excel, then you have high academic self-efficacy.

Self-efficacy may sound similar to a concept you may be familiar with already—*self-esteem*—but these are very different notions. Self-esteem refers to how much you like or "esteem" yourself—to what extent you believe you are a good and worthwhile person. Self-efficacy, however, refers to your self-confidence to perform well and to achieve in specific areas of life such as school, work, and relationships. Self-efficacy does influence self-esteem because how you feel about yourself overall is greatly influenced by your

confidence in your ability to perform well in areas that are important to you and to achieve valued goals. For example, if performing well in athletics is very important to you, then your self-efficacy for athletics will greatly influence your self-esteem; however, if performing well in athletics is not at all important to you, then your self-efficacy for athletics will probably have little impact on your self-esteem.

Self-efficacy begins to develop in very young children. Once self-efficacy is developed, it does not remain constant—it can change and grow as an individual has different experiences throughout his or her lifetime. When children are very young, their parents' self-efficacies are important (Jones & Prinz, 2005). Children of parents who have high parental self-efficacies perceive their parents as more responsive to their needs (Gondoli & Silverberg, 1997). Around the ages of 12 through 16, adolescents' friends also become an important source of self-efficacy beliefs. Adolescents who associate with peer groups that are not academically motivated tend to experience a decline in academic self-efficacy (Wentzel, Barry, & Caldwell, 2004). Adolescents who watch their peers succeed, however, experience a rise in academic self-efficacy (Schunk & Miller, 2002). This is an example of gaining self-efficacy through vicarious performances, as discussed above. The effects of self-efficacy that develop in adolescence are long-lasting. One study found that greater social and academic self-efficacy measured in people ages 14 to 18 predicted greater life satisfaction five years later (Vecchio, Gerbino, Pastorelli, Del Bove, & Caprara, 2007).

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Video 5. *Self-Esteem, Self-Efficacy, and Locus of Control.*

Major Influences on Self-Efficacy

Self-efficacy beliefs are influenced in five different ways (Bandura, 1997), which are summarized in the table below.

Influence	Definition
Performance Experiences	When you do well and succeed at a particular task to attain a valued goa, you usually believe that you will succeed again at this task. When you fail you often expect that you will fail again in the future if you try that task.
Vicarious Performances	If someone who seems similar to you succeeds, then you may come to believe that you will succeed as well.
Verbal Persuasion	This involves people telling you what they believe you are and are not capable of doing. Not all people will be equally persuasive.
Imaginal Performances	What you imagine yourself doing and how well or poorly you imagine yourself doing it.
Affective States & Physical Sensations	When you associate negative moods and negative physical sensations with failure, and positive physical sensations with success.

Table 2. Major Influences on Self-efficacy.

These five types of self-efficacy influence can take many real-world forms that almost everyone has experienced. You may have had previous performance experiences affect your academic self-efficacy when you did well on a test and believed that you would do well on the next test. A vicarious performance may have affected your athletic self-efficacy when you saw your best friend skateboard for the first time and thought that you could skateboard well,

too. Verbal persuasion could have affected your academic self-efficacy when a teacher that you respect told you that you could get into the college of your choice if you studied hard for the SATs. It's important to know that not all people are equally likely to influence your self-efficacy through verbal persuasion. People who appear trustworthy or attractive, or who seem to be experts, are more likely to influence your self-efficacy than are people who do not possess these qualities (Petty & Brinol, 2010). That's why a teacher you respect is more likely to influence your self-efficacy than a teacher you do not respect. Imaginal performances are an effective way to increase your self-efficacy. For example, imagining yourself doing well on a job interview actually leads to more effective interviewing (Knudstrup, Segrest, & Hurley, 2003). Affective states and physical sensations abound when you think about the times you have given presentations in class. For example, you may have felt your heart racing while giving a presentation. If you believe your heart was racing because you had just had a lot of caffeine, it likely would not affect your performance. If you believe your heart was racing because you were doing a poor job, you might believe that you cannot give the presentation well. This is because you associate the feeling of anxiety with failure and expect to fail when you are feeling anxious.

Benefits of High Self-Efficacy

Academic Performance

Consider academic self-efficacy in your own life and recall the earlier example of Sally and Lucy. Are you more like Sally, who has high academic self-efficacy and believes that she can use her abilities to do well in school, or are you more like Lucy, who does not believe that she can effectively use her academic abilities to excel

in school? Do you think your own self-efficacy has ever affected your academic ability? Do you think you have ever studied more or less intensely because you did or did not believe in your abilities to do well? Many researchers have considered how self-efficacy works in academic settings, and the short answer is that academic self-efficacy affects every possible area of academic achievement (Pajares, 1996).

Students who believe in their ability to do well academically tend to be more motivated in school (Schunk, 1991). When self-efficacious students attain their goals, they continue to set even more challenging goals (Schunk, 1990). This can all lead to better performance in school in terms of higher grades and taking more challenging classes (Multon, Brown, & Lent, 1991). For example, students with high academic self-efficacies might study harder because they believe that they are able to use their abilities to study effectively. Because they studied hard, they receive an A on their next test. Teachers' self-efficacies also can affect how well a student performs in school. Self-efficacious teachers encourage parents to take a more active role in their children's learning, leading to better academic performance (Hoover-Dempsey, Bassler, & Brissie, 1987).

Although there is a lot of research about how self-efficacy is beneficial to school-aged children, college students can also benefit from self-efficacy. Freshmen with higher self-efficacies about their ability to do well in college tend to adapt to their first year in college better than those with lower self-efficacies (Chemers, Hu, & Garcia, 2001). The benefits of self-efficacy continue beyond the school years: people with strong self-efficacy beliefs toward performing well in school tend to perceive a wider range of career options (Lent, Brown, & Larkin, 1986). In addition, people who have stronger beliefs of self-efficacy toward their professional work tend to have more successful careers (Stajkovic & Luthans, 1998).

One question you might have about self-efficacy and academic performance is how a student's actual academic ability interacts with self-efficacy to influence academic performance. The answer is that a student's actual ability does play a role, but it is also

influenced by self-efficacy. Students with greater ability perform better than those with lesser ability. But, among a group of students with the same exact level of academic ability, those with stronger academic self-efficacies outperform those with weaker self-efficacies. One study (Collins, 1984) compared performance on difficult math problems among groups of students with different levels of math ability and different levels of math self-efficacy. Among a group of students with average levels of math ability, the students with weak math self-efficacies got about 25% of the math problems correct. The students with average levels of math ability and strong math self-efficacies got about 45% of the questions correct. This means that by just having stronger math self-efficacy, a student of average math ability will perform 20% better than a student with similar math ability but weaker math self-efficacy. You might also wonder if self-efficacy makes a difference only for people with average or below-average abilities. Self-efficacy is important even for above-average students. In this study, those with above-average math abilities and low math self-efficacies answered only about 65% of the questions correctly; those with above-average math abilities and high math self-efficacies answered about 75% of the questions correctly.

Healthy Behaviors

Think about a time when you tried to improve your health, whether through dieting, exercising, sleeping more, or any other way. Would you be more likely to follow through on these plans if you believed that you could effectively use your skills to accomplish your health goals? Many researchers agree that people with stronger self-efficacies for doing healthy things (e.g., exercise self-efficacy, dieting self-efficacy) engage in more behaviors that prevent health problems and improve overall health (Strecher, DeVellis, Becker, & Rosenstock, 1986). People who have strong self-efficacy beliefs

about quitting smoking are able to quit smoking more easily (DiClemente, Prochaska, & Gibertini, 1985). People who have strong self-efficacy beliefs about being able to reduce their alcohol consumption are more successful when treated for drinking problems (Maisto, Connors, & Zywiak, 2000). People who have stronger self-efficacy beliefs about their ability to recover from heart attacks do so more quickly than those who do not have such beliefs (Ewart, Taylor, Reese, & DeBusk, 1983).

One group of researchers (Roach Yadrick, Johnson, Boudreaux, Forsythe, & Billon, 2003) conducted an experiment with people trying to lose weight. All people in the study participated in a weight loss program that was designed for the U.S. Air Force. This program had already been found to be very effective, but the researchers wanted to know if increasing people's self-efficacies could make the program even more effective. So, they divided the participants into two groups: one group received an intervention that was designed to increase weight loss self-efficacy along with the diet program, and the other group received only the diet program. The researchers tried several different ways to increase self-efficacy, such as having participants read a copy of *Oh, The Places You'll Go!* by Dr. Seuss (1990), and having them talk to someone who had successfully lost weight. The people who received the diet program and an intervention to increase self-efficacy lost an average of 8.2 pounds over the 12 weeks of the study; those participants who had only the diet program lost only 5.8 pounds. Thus, just by increasing weight loss self-efficacy, participants were able to lose over 50% more weight.

Studies have found that increasing a person's nutritional self-efficacy can lead them to eat more fruits and vegetables (Luszczynska, Tryburcy, & Schwarzer, 2006). Self-efficacy plays a large role in successful physical exercise (Maddux & Dawson, 2014). People with stronger self-efficacies for exercising are more likely to plan on beginning an exercise program, actually beginning that program (DuCharme & Brawley, 1995), and continuing it (Marcus, Selby, Niaura, & Rossi, 1992). Self-efficacy is especially important

when it comes to safe sex. People with greater self-efficacies about condom usage are more likely to engage in safe sex (Kaneko, 2007), making them more likely to avoid sexually transmitted diseases, such as HIV (Forsyth & Carey, 1998).

Athletic Performance

If you are an athlete, self-efficacy is especially important in your life. Professional and amateur athletes with stronger self-efficacy beliefs about their athletic abilities perform better than athletes with weaker levels of self-efficacy (Wurtele, 1986). This holds true for athletes in all types of sports, including track and field (Gernigon & Delloye, 2003), tennis (Sheldon & Eccles, 2005), and golf (Bruton, Mellalieu, Shearer, Roderique-Davies, & Hall, 2013). One group of researchers found that basketball players with strong athletic self-efficacy beliefs hit more foul shots than did basketball players with weak self-efficacy beliefs (Haney & Long, 1995). These researchers also found that the players who hit more foul shots had greater increases in self-efficacy after they hit the foul shots compared to those who hit fewer foul shots and did not experience increases in self-efficacy. This is an example of how we gain self-efficacy through performance experiences.

Self-Regulation

One of the major reasons that higher self-efficacy usually leads to better performance and greater success is that self-efficacy is an important component of self-regulation. Self-regulation is the complex process through which you control your thoughts, emotions, and actions (Gross, 1998). It is crucial to success and well-being in almost every area of your life. Every day, you are exposed

to situations where you might want to act or feel a certain way that would be socially inappropriate or that might be unhealthy for you in the long run. For example, when sitting in a boring class, you might want to take out your phone and text your friends, take off your shoes and take a nap, or perhaps scream because you are so bored. Self-regulation is the process that you use to avoid such behaviors and instead sit quietly through class. Self-regulation takes a lot of effort, and it is often compared to a muscle that can be exhausted (Baumeister, Bratslavsky, Muraven, & Tice, 1998). For example, a child might be able to resist eating a pile of delicious cookies if he or she is in the room with the cookies for only a few minutes, but if that child were forced to spend hours with the cookies, his or her ability to regulate the desire to eat the cookies would wear down. Eventually, his or her self-regulatory abilities would be exhausted, and the child would eat the cookies. A person with strong self-efficacy beliefs might become less distressed in the face of failure than might someone with weak self-efficacy. Because self-efficacious people are less likely to become distressed, they draw less on their self-regulation reserves; thus, self-efficacious people persist longer in the face of a challenge.

Self-efficacy influences self-regulation in many ways to produce better performance and greater success (Maddux & Volkmann, 2010). First, people with stronger self-efficacies have greater *motivation to perform* in the area for which they have stronger self-efficacies (Bandura & Locke, 2003). This means that people are motivated to work harder in those areas where they believe they can effectively perform. Second, people with stronger self-efficacies are more likely to *persevere through challenges* in attaining goals (Vancouver, More, & Yoder, 2008). For example, people with high academic self-efficacies are better able to motivate themselves to persevere through such challenges as taking a difficult class and completing their degrees because they believe that their efforts will pay off. Third, self-efficacious people believe that *they have more control over a situation*. Having more control over a situation means that self-efficacious people might be more

likely to engage in the behaviors that will allow them to achieve their desired goal. Finally, self-efficacious people *have more confidence* in their problem-solving abilities and, thus, are able to better use their cognitive resources and make better decisions, especially in the face of challenges and setbacks (Cervone, Jiwani, & Wood, 1991).

Self-regulation is the capacity to alter one's responses. It is broadly related to the term "self-control". The term "regulate" means to change something—but not just any change, rather change to bring it into agreement with some idea, such as a rule, a goal, a plan, or a moral principle. To illustrate, when the government regulates how houses are built, that means the government inspects the buildings to check that everything is done "up to code" or according to the rules about good building. In a similar fashion, when you regulate yourself, you watch and change yourself to bring your responses into line with some ideas about how they should be.

People regulate four broad categories of responses. They control their thinking, such as in trying to concentrate or to shut some annoying earworm tune out of their mind. They control their emotions, as in trying to cheer themselves up or to calm down when angry (or to stay angry, if that's helpful). They control their impulses, as in trying not to eat fattening food, trying to hold one's tongue, or trying to quit smoking. Last, they try to control their task performances, such as in pushing themselves to keep working when tired and discouraged, or deciding whether to speed up (to get more done) or slow down (to make sure to get it right).

Early Work on Delay of Gratification

Research on self-regulation was greatly stimulated by early experiments conducted by Walter Mischel and his colleagues (e.g., Mischel, 1974) on the capacity to delay gratification, which means being able to refuse current temptations and pleasures to work toward future benefits. In a typical study with what later

came to be called the "marshmallow test," a 4-year-old child would be seated in a room, and a favorite treat such as a cookie or marshmallow was placed on the table. The experimenter would tell the child, "I have to leave for a few minutes and then I'll be back. You can have this treat any time, but if you can wait until I come back, you can have two of them." Two treats are better than one, but to get the double treat, the child had to wait. Self-regulation was required to resist that urge to gobble down the marshmallow on the table so as to reap the larger reward.

Many situations in life demand similar delays for the best results. Going to college to get an education often means living in poverty and debt rather than getting a job to earn money right away. But in the long run, the college degree increases your lifetime income by hundreds of thousands of dollars. Very few nonhuman animals can bring themselves to resist immediate temptations so as to pursue future rewards, but this trait is an important key to success in human life.

watch it

Video 6. Watch as a teacher uses the Marshmallow Test, originally conducted by Walter Mischel, to teach her students about self-control. The Marshmallow Test has demonstrated correlations between self-control in preschool and successful outcomes in later life. According to Mischel, young children can learn strategies to delay gratification and resist engaging in impulsive behaviors. A retest of the study completed in 2018 by Watts, Duncan, and Quan found the effects of self-control in young children and the later life outcomes to be minimal and

more closely tied to the education level of the mother, rather than self-control.

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Benefits of Self-Control

People who are good at self-regulation do better than others in life. Follow-up studies with Mischel's samples found that the children who resisted temptation and delayed gratification effectively grew into adults who were better than others in school and work, more popular with other people, and who were rated as nicer, better people by teachers and others (Mischel, Shoda, & Peake, 1988; Shoda, Mischel, & Peake, 1990). College students with high self-control get better grades, have better close relationships, manage their emotions better, have fewer problems with drugs and alcohol, are less prone to eating disorders, are better adjusted, have higher self-esteem, and get along better with other people, as compared to people with low self-control (Tangney, Baumeister, & Boone, 2004). They are happier and have less stress and conflict (Hofmann, Vohs, Fisher, Luhmann, & Baumeister, 2013). Longitudinal studies have found that children with good self-control go through life with fewer problems, are more successful, are less likely to be

arrested or have a child out of wedlock, and enjoy other benefits (Moffitt et al., 2011). Criminologists have concluded that low self-control is a—if not the—key trait for understanding the criminal personality (Gottfredson & Hirschi, 1990; Pratt & Cullen, 2000).

Some researchers have searched for evidence that too much self-control can be bad (Tangney et al., 2004)—but without success. There is such a thing as being highly inhibited or clinically "over-controlled," which can impair initiative and reduce happiness, but that does not appear to be an excess of self-regulation. Rather, it may stem from having been punished excessively as a child and, therefore, adopting a fearful, inhibited approach to life. In general, self-control resembles intelligence in that the more one has, the better off one is, and the benefits are found through a broad range of life activities.

Three Ingredients of Effective Self-Regulation

For self-regulation to be effective, three parts or ingredients are involved. The first is standards, which are ideas about how things should (or should not) be. The second is monitoring, which means keeping track of the target behavior that is to be regulated. The third is the capacity to change.

Standards are an indispensable foundation for self-regulation. We already saw that self-regulation means a change in relation to some idea; without such guiding ideas, the change would largely be random and lacking direction. Standards include goals, laws, moral principles, personal rules, other people's expectations, and social norms. Dieters, for example, typically have a goal in terms of how much weight they wish to lose. They help their self-regulation further by developing standards for how much or how little to eat and what kinds of foods they will eat.

The second ingredient is monitoring. It is hard to regulate something without being aware of it. For example, dieters count

their calories. That is, they keep track of how much they eat and how fattening it is. In fact, some evidence suggests that dieters stop keeping track of how much they eat when they break their diet or go on an eating binge, and the failure of monitoring contributes to eating more (Polivy, 1976). Alcohol has been found to impair all sorts of self-regulation, partly because intoxicated persons fail to keep track of their behavior and compare it to their standards.

The combination of standards and monitoring was featured in an influential theory about self-regulation by Carver and Scheier (1981, 1982, 1998). Those researchers started their careers studying self-awareness, which is a key human trait. The study of self-awareness recognized early on that people do not simply notice themselves the way they might notice a tree or car. Rather, self-awareness always seemed to involve comparing oneself to a standard. For example, when a man looks in a mirror, he does not just think, "Oh, there I am," but more likely thinks, "Is my hair a mess? Do my clothes look good?" Carver and Scheier proposed that the reason for this comparison to standards is that it enables people to regulate themselves, such as by changing things that do not measure up to their standards. In the mirror example, the man might comb his hair to bring it into line with his standards for personal appearance. Good students keep track of their grades, credits, and progress toward their degree and other goals. Athletes keep track of their times, scores, and achievements, as a way to monitor improvement.

The process of monitoring oneself can be compared to how a thermostat operates. The thermostat checks the temperature in the room compares it to a standard (the setting for the desired temperature), and if those do not match, it turns on the heat or air conditioner to change the temperature. It checks again and again, and when the room temperature matches the desired setting, the thermostat turns off the climate control. In the same way, people compare themselves to their personal standards, make changes as needed, and stop working on change once they have met their goals. People feel good not just when they reach their goals but even when

they deem they are making good progress (Carver & Scheier, 1990). They feel bad when they are not making sufficient progress.

That brings up the third ingredient, which is the capacity to change oneself. In effective self-regulation, people operate on themselves to bring about these changes. The popular term for this is "willpower," which suggests some kind of energy is expended in the process. Psychologists hesitate to adopt terms associated with folk wisdom because there are many potential implications. Here, the term is used to refer specifically to some energy that is involved in the capacity to change oneself.

Consistent with the popular notion of willpower, people do seem to expend some energy during self-regulation. Many studies have found that after people exert self-regulation to change some response, they perform worse on the next unrelated task if it too requires self-regulation (Hagger, Wood, Stiff, & Chatzisarantis, 2010). That pattern suggests that some energy such as willpower was used up during the first task, leaving less available for the second task. The term for this state of reduced energy available for self-regulation is ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Current research provides mixed results on ego depletion, and we need further study to better understand when and how it occurs. It may be that as people go about their daily lives, they gradually become ego-depleted because they are exerting self-control and resisting temptations. Some research suggests that during the state of ego depletion people become less helpful and more aggressive, prone to overeat, misbehave sexually, and express more prejudice (Hofmann, Vohs, & Baumeister, 2012).

Thus, a person's capacity for self-regulation is not constant, but rather it fluctuates. To be sure, some people are generally better than others at controlling themselves (Tangney et al., 2004). But even someone with excellent self-control may occasionally find that control breaks down under ego depletion. In general, self-regulation can be improved by getting enough sleep and healthy food, and by minimizing other demands on one's willpower.

There is some evidence that regular exercise of self-control can

build up one's willpower, like strengthening a muscle (Baumeister & Tierney, 2011; Oaten & Cheng, 2006). Even in early adulthood, one's self-control can be strengthened. Furthermore, research has shown that disadvantaged, minority children who take part in preschool programs such as Head Start (often based on the Perry program) end up doing better in life even as adults. This was thought for a while to be due to increases in intelligence quotient (IQ), but changes in IQ from such programs are at best temporary. Instead, recent work indicates that improvement in self-control and related traits may be what produce the benefits (Heckman, Pinto, & Savelyev, in press). It's not doing math problems or learning to spell at age 3 that increases subsequent adult success—but rather the benefit comes from having some early practice at planning, getting organized, and following rules.

Self-Esteem

Self-esteem is defined as one's thoughts and feelings about one's self-concept and identity–it is an evaluative judgment about who we are. Most theories on self-esteem state that there is a grand desire, across all genders and ages, to maintain, protect, and enhance their self-esteem.

The emergence of cognitive skills in early childhood results in improved perceptions of the self, but they tend to focus on external qualities, which are referred to as the categorical self. When researchers ask young children to describe themselves, their descriptions tend to include physical descriptors, preferred activities,
and favorite possessions. Thus, the self-description of a 3-year-old might be a 3-year-old girl with red hair, who likes to play with blocks. However, even children as young as three know there is more to themselves than these external characteristics.

Harter and Pike (1984) challenged the method of measuring

personality with an open-ended question as they felt that language limitations were hindering the ability of young children to express their self-knowledge. They suggested a change to the method of measuring self-concept in young children, whereby researchers provide statements that ask whether something is true of the child (e.g., "I like to boss people around", "I am grumpy most of the time"). They discovered that in early childhood, children answer these statements in an internally consistent manner, especially after the age of four (Goodvin, Meyer, Thompson & Hayes, 2008), and often give similar responses to what others (parents and teachers) say about the child (Brown, Mangelsdorf, Agathen, & Ho, 2008; Colwell & Lindsey, 2003).

Young children tend to have a generally positive self-image. This optimism is often the result of a lack of social comparison when making self-evaluations (Ruble, Boggiano, Feldman, & Loeble, 1980), and with comparison between what the child once could do to what they can do now (Kemple, 1995). However, this does not mean that preschool children are exempt from negative self-evaluations. Preschool children with insecure attachments to their caregivers tend to have lower self-esteem at age four (Goodvin et al., 2008). Maternal negative affect (emotional state) was also found by Goodwin and her colleagues to produce more negative self-evaluations in preschool children.

Remarkably, children begin developing social understanding very early in life and are also able to include other peoples' appraisals of them into their self-concept, including parents, teachers, peers, culture, and media. Internalizing others' appraisals and creating social comparison affect children's self-esteem, which is defined as an evaluation of one's identity. Children can have individual assessments of how well they perform a variety of activities and also develop an overall, global self-assessment. If there is a discrepancy between how children view themselves and what they consider to be their ideal selves, their self-esteem can be negatively affected.

In middle childhood, friendships take on new importance as

judges of one's worth, competence, and attractiveness. Friendships provide the opportunity for learning social skills such as how to communicate with others and how to negotiate differences. Children get ideas from one another about how to perform certain tasks, how to gain popularity, what to wear, say, and listen to, and how to act. This society of children marks a transition from a life focused on the family to a life concerned with peers. Peers play a key role in a child's self-esteem at this age as any parent who has tried to console a rejected child will tell you. No matter how complimentary and encouraging the parent may be, being rejected by friends can only be remedied by renewed acceptance.

In adolescence, teens continue to develop their self-concept. Their ability to think of the possibilities and to reason more abstractly may explain the further differentiation of the self during adolescence. However, the teen's understanding of self is often full of contradictions. Young teens may see themselves as outgoing but also withdrawn, happy yet often moody, and both smart and completely clueless (Harter, 2012). These contradictions, along with the teen's growing recognition that their personality and behavior seem to change depending on who they are with or where they are, can lead the young teen to feel like a fraud. With their parents, they may seem angrier and sullen, with their friends they are more outgoing and goofy, and at work, they are quiet and cautious. "Which one is really me?" may be the refrain of the young teenager.

Harter (2012) found that adolescents emphasize traits such as being friendly and considerate more than do children, highlighting their increasing concern about how others may see them. Harter also found that older teens add values and moral standards to their self-descriptions. As self-concept develops, so does self-esteem. In addition to the academic, social, appearance, and physical/athletic dimensions of self-esteem in middle and late childhood, teens also add perceptions of their competency in romantic relationships, on the job, and in close friendships (Harter, 2006).

Contrary to popular belief, there is no empirical evidence for a significant drop in self-esteem throughout

adolescence. "Barometric self-esteem" fluctuates rapidly and can cause severe distress and anxiety, but baseline self-esteem remains highly stable across adolescence. The validity of global self-esteem scales has been questioned, and many suggest that more specific scales might reveal more about the adolescent experience.

Self-esteem often decreases when children transition from one school setting to another, such as shifting from elementary to middle school, or junior high to high school (Ryan, Shim, & Makara, 2013). These decreases are usually temporary unless there are additional stressors such as parental conflict, or other family disruptions (De Wit, Karioja, Rye, & Shain, 2011). Self-esteem rises from mid to late adolescence for most teenagers, especially if they feel confident in their peer relationships, their appearance, and athletic abilities (Birkeland, Melkivik, Holsen, & Wold, 2012).

There are several self-concepts and situational factors that tend to impact an adolescent's self-esteem. Teens that are close to their parents and their parents are authoritative tend to have higher self-esteem. Further, when adolescents are recognized for their successes, have set high vocational aspirations, are athletic, or feel attractive, they have higher self-esteem. Teens tend to have lower self-esteem when entering middle school, feel peer rejection, and experience academic failure. Also, adolescents that have authoritarian or permissive parents, need to relocate, or have low socioeconomic status, are more likely to experience lower self-esteem.

Girls are most likely to enjoy high self-esteem when engaged in supportive relationships with friends; the most important function of friendship to them is having someone who can provide social and moral support. When they fail to win friends' approval or cannot find someone with whom to share common activities and interests, in these cases, girls suffer from low self-esteem.

In contrast, boys are more concerned with establishing and asserting their independence and defining their relation to authority. As such, they are more likely to derive high self-esteem from their ability to influence their friends. On the other hand,

the lack of romantic competence, for example, failure to win or maintain the affection of a romantic interest is the major contributor to low self-esteem in adolescent boys.

Self Esteem Types

According to Mruk (2003), self-esteem is based on two factors: competence and worthiness. The relationship between competence and worthiness defines one's self-esteem type. As these factors are a spectrum, we can even further differentiate self-esteem types and potential issues associated with each (Figure 8.1).

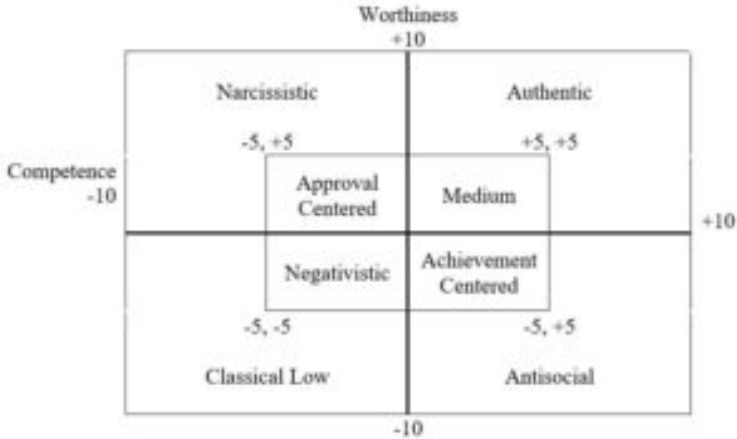

Figure 1. Self-Esteem meaning matrix with basic types and levels. Adapted from Mruk, 2003.

Those with high levels of competence and those that feel highly worthy will have high self-esteem. This self-esteem type tends to be stable and characterized by openness to new experiences and a tendency towards optimism. Those at the medium-high self-esteem type feel adequately competent and worthy. At the authentic level,

individuals are realistic about their competence and feel worthy. They will actively pursue a life of positive, intrinsic values.

Individuals with low levels of competence and worthiness will have low self-esteem. At the negativistic level, people tend to be cautious and are protective of what little self-esteem that they do possess. Those at the classic low self-esteem level experienced impaired function due to their low feelings of competence and worth and are at risk for depression and giving up.

It is also possible to have high levels of competence but feel unworthy. This combination is a defensive or fragile self-esteem type, called competence-based self-esteem, where the person tends to compensate for their low levels of worthiness by focusing on their competence. At the success-seeking level, these individuals' self-esteem is contingent on their achievements, and they are often anxious about failure. The Antisocial level includes an exaggerated need for success and power, even as to the point of acting out aggressively to achieve it.

The combination of low competence and high worthiness is worthiness-based self-esteem. This type is another defensive or fragile self-esteem where the individual has a low level of competence and compensates by focusing instead on their worthiness. At the approval-seeking level, these individuals are sensitive to criticism and rejection and base their self-esteem on the approval of others. At the narcissistic level, people will have an exaggerated sense of self-worth regardless of the lack of competencies. They also tend to be highly reactive to criticism and are very defensive.

Multiple Selves

Early in adolescence, cognitive developments result in greater self-awareness, greater awareness of others and their thoughts and judgments, the ability to think about abstract, future possibilities, and the ability to consider multiple possibilities at once. As a result, adolescents experience a significant shift from the simple, concrete, and global self-descriptions typical of young children; as children, they defined themselves by physical traits, whereas adolescents define themselves based on their values, thoughts, and opinions.

Adolescents can conceptualize multiple "possible selves" that they could become and long-term possibilities and consequences of their choices. Exploring these possibilities may result in abrupt changes in self-presentation as the adolescent chooses or rejects qualities and behaviors, trying to guide the actual self toward the ideal self (whom the adolescent wishes to be) and away from the feared self (whom the adolescent does not want to be). For many, these distinctions are uncomfortable, but they also appear to motivate achievement through behavior consistent with the ideal and distinct from the feared possible selves.

Further distinctions in self-concept, called "differentiation," occur

as the adolescent recognizes the contextual influences on their behavior and the perceptions of others, and begins to qualify their traits when asked to describe themselves. Differentiation appears fully developed by mid-adolescence. Peaking in the 7th-9th grades, the personality traits adolescents use to describe themselves refer to specific contexts, and therefore may contradict one another. The recognition of inconsistent content in the self-concept is a common source of distress in these years, but this distress may benefit adolescents by encouraging structural development.

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Identity Development Theory

A well-developed identity is comprised of goals, values, and beliefs to which a person is committed. It is the awareness of the consistency in self over time, the recognition of this consistency by others (Erikson, 1980). The process of identity development is both an individual and social phenomenon (Adams & Marshall, 1996). Much of this process is assumed during adolescence when cognitive development allows for an individual to construct a 'theory of self' (Elkind, 1998) based on exposure to role models and identity options (Erikson, 1980). Erikson (1968) believed this period of development to be an 'identity crisis,' a crucial turning point in which an individual must develop in one way or another, ushering the adolescent toward growth and differentiation. Identity is formed through a process of exploring options or choices and committing to an option based upon the outcome of their exploration. Failure to establish a well-developed sense of identity can result in identity confusion. Those experiencing identity confusion do not have a clear sense of who they are or their role in society.

Identity development is vital to a person's understanding of self and participation in their social systems. Adams and Marshall (1996) established that identity formation provides five functions: a structure and order to self-knowledge; a sense of consistency and coherence to beliefs, goals, and self-knowledge; a sense of continuity for one's history and future; goals and direction; a sense of personal control of their choices and outcomes.

Freud's Theory

We begin with the often controversial figure, Sigmund Freud (1856-1939). Freud has been a very influential figure in the area of

development; his view of development and psychopathology dominated the field of psychiatry until the growth of behaviorism in the 1950s. His assumptions that personality forms during the first few years of life and that the ways in which parents or other caregivers interact with children have a long-lasting impact on children's emotional states have guided parents, educators, clinicians, and policy-makers for many years. We have only recently begun to recognize that early childhood experiences do not always result in certain personality traits or emotional states. There is a growing body of literature addressing resilience in children who come from harsh backgrounds and yet develop without damaging emotional scars (O'Grady and Metz, 1987). Freud has stimulated an enormous amount of research and generated many ideas. Agreeing with Freud's theory in its entirety is hardly necessary for appreciating the contribution he has made to the field of development.

Freud's theory of self suggests that there are three parts of the self. The **id** is the part of the self that is inborn. It responds to biological urges without pause and is guided by the principle of pleasure: if it feels good, it is the thing to do. A newborn is all id. The newborn cries when hungry, defecates when the urge strikes.

The **ego** develops through interaction with others and is guided by logic or the reality principle. It has the ability to delay gratification. It knows that urges have to be managed. It mediates between the id and **superego** using logic and reality to calm the other parts of the self.

The superego represents society's demands for its members. It is guided by a sense of guilt. Values, morals, and the conscience are all part of the superego.

The personality is thought to develop in response to the child's ability to learn to manage biological urges. Parenting is important here. If the parent is either overly punitive or lax, the child may become fixated and not progress to the next stage. Here is a brief introduction to Freud's stages.

Frustration, Overindulgence, and Fixation

Some people do not seem to be able to leave one stage and proceed on to the next. One reason for this may be that the needs of the developing individual at any particular stage may not have been adequately met in which case there is frustration. Or possibly the person's needs may have been so well satisfied that he/she is reluctant to leave the psychological benefits of a particular stage in which there is overindulgence. Both frustration and overindulgence (or any combination of the two) may lead to what psychoanalysts call **fixation** at a particular psychosexual stage. Fixation refers to the theoretical notion that a portion of the individual's libido has been permanently 'invested' in a particular stage of his development.

Stages of Psychosexual Development

Oral Stage

The **oral stage** lasts from birth until around age 2. The infant is all id. At this stage, stimulation and comfort are focused on the mouth and are based on the
reflex of sucking. Too much indulgence or too little stimulation may lead to fixation, resulting in a person continuing to see oral stimulation and comfort well beyond infancy. Of much focus is how parents manage the weaning process as a cause for fixation.

Children weaned too early or too late may seek ongoing oral stimulation.

Anal Stage

The **anal stage** begins around 18 months of age and lasts until the child is three years old. During the anal stage, Freud believed that the libido source shifted from the mouth (in stage 1) to the anus and the ego is beginning to develop in this stage. The child, then, receives pleasure from defecating. The child, at this point, understands that they have some amount of control over their lives, including control of when and where they defecate. This can set-up difficulties in potty training. What matters, in terms of Freud's theory, is how the parent handles difficulties in potty training. Poor parental reactions during potty training may result in anal fixation; the fixated child may react in one of two ways: (1) parents who are harsh or who ridicule the child for mistakes may have children who stubbornly hold on to their feces in an effort to not have an accident – these children may become anal retentive or (2) parents who are too easy-going may have a child who reacts by purposefully making a mess – these children may become anal expulsive. Adults who are anal retentive tend to be stubborn, very neat, rigid, and stingy. Adults who are anal expulsive tend to be messy, wasteful, and harsh.

Link to Learning: Toilet TRaining

To the relief of most parents, there is very little evidence to suggest that Freud was right about fixations caused during the anal stage, mainly because the theory itself would be very difficult to test. Nevertheless, parents worry

about toilet training, and whether they will be able to guide their children through the process unscathed. Kidshealth.org has a good web page on to potty training that may help parents worried about toilet training.

Phallic Stage

The phallic stage of psychosexual development occurs from ages three to six. According to Freud, during the **phallic stage,** the child develops an attraction to the opposite sex parent, which is called the Oedipus Complex for boys and the Electra Complex for girls. When the child recognizes that the opposite sex parent is unavailable, the child learns to model their own behavior after the same-sex parent. The child develops their own sense of masculinity or femininity from this resolution. According to Freud, a person who does not exhibit gender appropriate behavior, such as a woman who competes with men for jobs or a man who lacks self-assurance and dominance, has not successfully completed this stage of development. Consequently, such a person continues to struggle with his or her own gender identity.

Chodorow, a neo-Freudian, believed that mothering promotes gender stereotypic behavior. Mothers push their sons away too soon and direct their attention toward problem-solving and independence. As a result, sons grow up confident in their own abilities but uncomfortable with intimacy. Girls are kept dependent too long and are given unnecessary and even unwelcome assistance from their mothers. Girls learn to underestimate their abilities and lack assertiveness but feel comfortable with intimacy.

Both of these models assume that early childhood experiences result in lifelong gender self-concepts. However, gender socialization is a process that continues throughout life. Children,

teens, and adults refine and can modify their sense of self, based on gender.

Another important part of Freud's phallic stage is that during this time the child is learning right from wrong through the process of **introjection**. Remember that according to Kohlberg, the child during this time is developing a sense of morality. According to Freud, this is occurring through the process of introjection which occurs as children incorporate values from others into their value set. Freud theorized about parental introjection, where children learn that parents seem pleased by certain behaviors (and so want to do those behaviors more to get rewards and love) and displeased by other behaviors (and so want to do those behaviors less to avoid punishment and loss of love). Today, modern psychoanalytic theorists recognize the place of others and society in introjection. Societal introjection is becoming more and more important as more children go to daycare, as we are more surrounded by technology and advertising, and as we travel more.

Latency Stage

Freud's fourth stage of psychosexual development is the latency stage. This stage begins around age 6 and lasts until puberty. In the latency stage, children are actually doing very little psychosexual development according to Freud. Where pleasure and development occurred through erogenous zones in the first 3 stages, in the latency stage all pleasure from erogenous zones is repressed. In other words, it is latent—hence the stage's name. Freud believed that in the latency stage all development and stimulation come from secondary sources since the erogenous forces are repressed. These secondary sources can include education, forming various social relationships, and hobbies.

Genital Stage

The genital stage is the last stage of Freud's psychosexual theory of personality development, and begins in puberty. It is a time of adolescent sexual experimentation, the successful resolution of which is settling down in a loving one-to-one relationship with another person in our 20's. Sexual instinct is directed to heterosexual pleasure, rather than self-pleasure like during the phallic stage.

For Freud, the proper outlet of the sexual instinct in adults was through heterosexual intercourse. Fixation and conflict may prevent this with the consequence that sexual perversions may develop. For example, fixation at the oral stage may result in a person gaining sexual pleasure primarily from kissing and oral sex, rather than sexual intercourse.

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Video 1. *Freud's Psychosexual Stages of Development.*

Strengths and Weaknesses of Freud's Theory

Freud's theory has been heavily criticized for several reasons. One is that it is very difficult to test the unconscious mind scientifically. How can parenting in infancy be traced to personality in adulthood? Are there other variables that might better explain development?

The theory is also considered to be sexist in suggesting that women who do not accept an inferior position in society are somehow psychologically flawed. Freud focuses on the darker side of human nature and suggests that
much of what determines our actions are unknown to us. So why do we study Freud? As mentioned above, despite the criticisms, Freud's assumptions about the importance of early childhood experiences in shaping our psychological selves have found their way into child development, education, and parenting practices. Freud's theory has heuristic value in providing a framework from which to elaborate and modify subsequent theories of development. Many later theories, particularly behaviorism and humanism, were challenges to

Erikson's Stages of Psychosexual Development

Erik Erikson's theory of psychosocial development emphasizes the social nature of our development. His theory proposed that our psychosocial development takes place throughout our lifespan. Erikson suggested that how we interact with others is what affects our sense of self, or what he called the ego identity. He also believed that we are motivated by a need to achieve competence in certain areas of our lives.

According to psychosocial theory, we experience eight stages of development over our lifespan (Table 8.1), from infancy through late adulthood. At each stage, there is a conflict, or task, that we need to resolve. Successful completion of each developmental task results in a sense of competence and a healthy personality. Failure to master these tasks leads to feelings of inadequacy.

Figure 1. Erik Erikson

Table 1. Erikson's psychosocial Stages of Development

Stage	Age (years)	Developmental Task	Description
1	0–1	Trust vs. mistrust	Trust (or mistrust) that basic needs, such as nourishment and affection, will be met
2	1–3	Autonomy vs. shame/doubt	Develop a sense of independence in many tasks
3	3–6	Initiative vs. guilt	Take the initiative on some activities—may develop guilt when unsuccessful or boundaries overstepped
4	7–11	Industry vs. inferiority	Develop self-confidence in abilities when competent or sense of inferiority when not
5	12–18	Identity vs. confusion	Experiment with and develop identity and roles
6	19–29	Intimacy vs. isolation	Establish intimacy and relationships with others
7	30–64	Generativity vs. stagnation	Contribute to society and be part of a family
8	65–	Integrity vs. despair	Assess and make sense of life and meaning of contributions

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=104#oembed-1

Video 2. Erikson's Psychosocial Development explains all stages of this theory.

Trust vs. mistrust

Erikson maintained that the first year to year and a half of life involves the establishment of a sense of trust. Infants are dependent and must rely on others to meet their basic physical needs as well as their needs for stimulation and comfort. A caregiver who consistently meets these needs instills a sense of trust or the belief that the world is a safe and trustworthy place. The caregiver should not worry about overindulging a child's need for comfort, contact, or stimulation. This view is in sharp contrast with the Freudian view that a parent who overindulges the infant by allowing them to suck too long or be picked up too frequently will be spoiled or become fixated at the oral stage of development.

Consider the implications for establishing trust if a caregiver is unavailable or is upset and ill-prepared to care for a child, or if a child is born prematurely, is unwanted, or has physical problems that could make them less desirable to a parent. However, keep in mind that children can also exhibit strong resiliency to harsh circumstances. Resiliency can be attributed to certain personality

factors, such as an easy-going temperament and receiving support from others. A positive and strong support group can help a parent and child build a strong foundation by offering assistance and positive attitudes toward the newborn and parent.

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Autonomy vs. shame and doubt

As the child begins to walk and talk, an interest in independence or autonomy replaces their concern for trust. The toddler tests the limits of what can be touched, said, and explored. Erikson believed that toddlers should be allowed to explore their environment as freely as safety allows and, in doing so, will develop a sense of independence that will later grow to self-esteem, initiative, and overall confidence. If a caregiver is overly anxious about the toddler's actions for fear that the child will get hurt or violate others' expectations, the caregiver can give the child the message that they should be ashamed of their behavior and instill a sense of doubt in their abilities. Parenting advice based on these ideas would be to keep your toddler safe, but let them learn by doing. A sense of pride seems to rely on doing rather than being told how capable one is (Berger, 2005).

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Initiative vs. Guilt

While Erik Erikson was very influenced by Freud, he believed that the relationships that people have, not psychosexual stages, are what influence personality development. At the beginning of early childhood, the child is still in the autonomy versus shame and doubt stage (stage 2).

By age three, the child begins stage 3: initiative versus guilt. The trust and autonomy of previous stages develop into a desire to take initiative or to think of ideas and initiate action. Children are curious at this age and start to ask questions so that they can learn about the world. Parents should try to answer those questions without making the child feel like a burden or implying that the child's question is not worth asking.

These children are also beginning to use their imagination (remember what we learned when we discussed Piaget!). Children may want to build a fort with the cushions from the living room couch, open a lemonade stand in the driveway, or make a zoo with their stuffed animals and issue tickets to those who want to come. Another way that children may express autonomy is in wanting to get themselves ready for bed without any assistance. To reinforce taking initiative, caregivers should offer praise for the child's efforts and avoid being overly critical of messes or mistakes. Soggy washrags and toothpaste left in the sink pale in

comparison to the smiling face of a five-year-old emerging from the bathroom with clean teeth and pajamas!

That said, it is important that the parent does their best to kindly guide the child to the right actions. Remember that according to Freud and Kohlberg, children are developing a sense of morality during this time. Erikson agrees. If the child does leave those soggy washrags in the sink, have the child help clean them up. It is possible that the child will not be happy with helping to clean, and the child may even become aggressive or angry, but it is important to remember that the child is still learning how to navigate their world. They are trying to build a sense of autonomy, and they may not react well when they are asked to do something that they had not planned. Parents should be aware of this, and try to be understanding, but also firm. Guilt for a situation where a child did not do their best allows a child to understand their responsibilities and helps the child learn to exercise self-control (remember the marshmallow test). The goal is to find a balance between initiative and guilt, not a free-for-all where the parent allows the child to do anything they want to. The parent must guide the child if they are to have a successful resolution in this stage.

watch it

Video 3. Movies, television, and media, in general, provide many examples of psychosocial development. The movie clips in this video demonstrate Erikson's third stage of development, initiative versus guilt. What other examples can you think of to demonstrate young children developing a sense of autonomy?

One or more interactive elements has been excluded from this version of the text. You can view them online here:
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Industry vs. Inferiority

As we have seen in previous modules, Erikson believes that children's greatest source of personality development comes from their social relationships. So far, we have seen 3 psychosocial stages: trust versus mistrust (ages birth – 18 months), autonomy versus shame and doubt (ages 18 months – 3 years), and initiative versus guilt (ages 3 years – around 6 years).

According to Erikson, children in middle childhood are very busy or industrious. They are constantly doing, planning, playing, getting together with friends, and achieving. This is a very active time and a time when they are gaining a sense of how they measure up when compared with friends. Erikson believed that if these industrious children view themselves as successful in their endeavors, they will get a sense of competence for future challenges. If instead, a child feels that they are not measuring up to their peers, feelings of inferiority and self-doubt will develop. These feelings of inferiority can, according to Erikson, lead to an inferiority complex that lasts into adulthood.

To help children have a successful resolution in this stage, they

should be encouraged to explore their abilities. They should be given authentic feedback as well. Failure is not necessarily a horrible thing according to Erikson. Indeed, failure is a type of feedback that may help a child form a sense of modesty. A balance of competence and modesty is ideal for creating a sense of competence in the child.

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Identity vs. Identity Confusion

Erik Erikson believed that the primary psychosocial task of adolescence was establishing an identity. Erikson referred to life's fifth psychosocial task as one of **identity versus identity confusion** when adolescents must work through the complexities of finding one's own identity. This stage includes questions regarding their appearance, vocational choices and career aspirations, education, relationships, sexuality, political and social views, personality, and interests. Erikson saw this as a period of confusion and experimentation regarding identity and one's life path. During adolescence, we experience a **psychological moratorium**, where teens put on hold commitment to an identity while exploring the options.

Individual identity development is influenced by how they resolved all of the previous childhood psychosocial crises, and this adolescent stage is a bridge between the past and the future, childhood, and adulthood. Thus, in Erikson's view, an adolescent's

central questions are, "Who am I?" and "Who do I want to be?" Identity formation was highlighted as the primary indicator of successful development during adolescence (in contrast to role confusion, which would be an indicator of not successfully meeting the task of adolescence). This crisis is resolved positively with **identity achievement** and the gain of fidelity (ability to be faithful) as a new virtue when adolescents have reconsidered the goals and values of their parents and culture. Some adolescents adopt the values and roles that their parents expect for them. Other teens develop identities that are in opposition to their parents but align with a peer group. This change is common as peer relationships become a central focus in adolescents' lives.

The culmination of this exploration is a more coherent view of oneself. Those who are unsuccessful at resolving this stage may withdraw further into social isolation or become lost in the crowd. However, more recent research suggests that few leave this age period with identity achievement and that most identity formation occurs during young adulthood (Côtè, 2006).

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Marcia's Identity Statuses

Expanding on Erikson's theory, Marcia (1966) described identity formation during adolescence as involving both *exploration* and *commitment* with respect to ideologies and occupations (e.g.,

religion, politics, career, relationships, gender roles). Identity development begins when individuals identify with role models who provide them with options to explore for whom they can become. As identity development progresses, adolescents are expected to make choices and commit to options within the confines of their social contexts. In some cases, options are not provided or are limited, and the individual will fail to commit or will commit without the opportunity to explore various options (Marcia, 1980).

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Video 4. Macia's Stages of Adolescent Identity Development summarizes the various identity statuses and how an individual may move through them.

Identity confusion/diffusion occurs when adolescents neither explore nor commit to any identities. **Foreclosure** occurs when an individual commits to an identity without exploring options. **A moratorium** is a state in which adolescents are actively exploring options but have not yet made commitments. As mentioned earlier, individuals who have explored different options, discovered their purpose, and have made identity commitments are in a state of **identity achievement.**

		Individual has committed to identity	
		Yes	No
Individual has explored identity options	Yes	Identity Achievement	Moratorium
	No	Foreclosure	Identity Diffusion

Figure 2. Marcia's identity statuses. Adapted from Discovering the Lifespan, by R. S. Feldman, 2009.

The least mature status, and one common in many children, is identity diffusion. **Identity diffusion** *is a status that characterizes those who have neither explored the options nor made a commitment to an identity*. Marcia (1980) proposed that when individuals enter the identity formation process, they have little awareness or experience with identity exploration or the expectation to commit to an identity. This period of identity diffusion is typical of children and young adolescents, but adolescents are expected to move out of this stage as they are exposed to role models and experiences that present them with identity possibilities. Those who persist in this identity may drift aimlessly with little connection to those around them or have little sense of purpose in life. Characteristics associated with prolonged diffusion include low self-esteem, easily influenced by peers, lack of meaningful friendships, little commitment, or fortitude in activities or relationships, self-absorbed, and self-indulgent.

Those in **identity foreclosure** *have committed to an identity without having explored the options*. Often, younger adolescence will enter a phase of foreclosure where they may, at least preliminarily, commit to an identity without an investment in the exploration

process. This commitment is often a response to anxiety about uncertainty or change during adolescence or pressure from parents, social groups, or cultural expectations. It is expected that most adolescents will progress beyond the foreclosure phase as they can think independently, and we multiple identity options. However, sometimes foreclosure will persist into late adolescence or even adulthood.

In some cases, parents may make these decisions for their children and do not grant the teen the opportunity to make choices. In other instances, teens may strongly identify with parents and others in their life and wish to follow in their footsteps. Characteristics associated with prolonged foreclosure well-behaved and obedient children with a high need for approval, authoritarian parenting style, low levels of tolerance or acceptance of change, high levels of conformity, and conventional thinking.

During high school and college years, teens and young adults move from identity diffusion and foreclosure toward moratorium and achievement. The most significant gains in the development of identity are in college, as college students are exposed to a greater variety of career choices, lifestyles, and beliefs. This experience is likely to spur on questions regarding identity. A great deal of the identity work we do in adolescence and young adulthood is about values and goals, as we strive to articulate a personal vision or dream for what we hope to accomplish in the future (McAdams, 2013).

Identity moratorium *is* a status that describes those who are actively exploring in an attempt to establish identity but have yet to have made any commitment. This time can be an anxious and emotionally tense period as the adolescent experiments with different roles and explores various beliefs. Nothing is guaranteed, and there are many questions, but few answers. This moratorium phase is the precursor to identity achievement. During the moratorium period, it is normal for adolescents to be rebellious and uncooperative, avoid dealing with problems, procrastinate,

experience low self-esteem, feel anxious, and uncertain about decisions.

Identity achievement refers to those who, after exploration, have committed. Identity achievement is a long process and is not often realized by the end of adolescence. Individuals that do reach identity achievement feel self-acceptance, stable self-definition, and are committed to their identity.

While Marcia's statuses help us understand the process of developing identity, there are several criticisms of this theory. First, identity status may not be global; different aspects of your identity may be in different statuses. An individual may be in multiple identity statuses at the same time for different aspects of identity. For example, one could be in the foreclosure status for their religious identity, but in moratorium for career identity, and achievement for gender identity.

Further, identity statuses do no always develop in the sequence described above, although it is the most common progression. Not all people will reach identity achievement in all aspects of their identity, and not all may remain in identity achievement. There may be a third aspect of identity development, beyond exploration and commitment, and that is the reconsideration of commitment. This addition would create a fifth status, **searching moratorium**. This status is a re-exploring after a commitment has been made (Meesus et al., 2012). It is not usual that commitments to aspects of our identity may change as we gain experiences, and more options become available to explore. This searching moratorium may continue well into adulthood.

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Supporting Identity Development

As the process of identity development can be a confusing and challenging period, how can adults support adolescents through this process? First, affirm that the anxiety, doubts, and confusion are reasonable and that most teens do not complete identity achievement before graduating high school. Exposing adolescents to various role models can help them imagine different roles or options for their future selves. Role models can come from within the family, schools, or community. Adults should talk with adolescents about their values, goals, and identities to help build awareness. They may be interested to know how others made decisions while developing their own identities. Finally, support the commitments that adolescents have made. Identity commitments can help someone feel grounded and less confused while they engage in identity exploration.

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Domains of Identity

As mentioned previously, there are several significant areas of identity development, and each domain may progress through the identity development process independently. Some of the most widely studied domains of identity development include cultural, gender, sexual, ideological, and occupational identity.

Cultural Identity

Cultural identity: Cultural identity refers to how people come to terms with whom they are based on their ethnic, racial, and cultural ancestry. According to the U.S. Census (2012), more than 40% of Americans under the age of 18 are from ethnic minorities. At this point, you are probably aware of the cultural groups to which you belong (i.e., "I am a Latino, middle-class, (almost) college-educated male"). Do you remember the process of coming to awareness of your cultural identity—when did you know you were white and what that meant? Was it during childhood, as a teenager, or reading this chapter? Has your understanding, or acceptance, of your racial heritage changed during your lifetime?

For most people, it does. Just as Piaget organized the growth of children according to various stages of development, cultural scholars have similarly organized racial awareness along models and stages. Before explaining the various models, let us make a couple of general comments about models. One, a model is not the thing it represents. Is the model car you played with as a child the same as the actual automobile? What were the differences? Size, time, maneuverability, details? These same kinds of differences exist between the model of racial identity development and the actual personal process. However, just like the car model gives a

relatively accurate picture of the actual automobile, so do the racial identity models. Two, these models are general and not meant to fit perfectly to every individual's experience. With that said, let us examine the process of coming to an understanding of our racial identity.

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Video 1. *Demographic Structure of Society–Race and Ethnicity* provides more information on the structures of race and ethnicity and how minority and majority identity is constructed.

To better understand this complex process, and in recognition of the above discussion regarding the distinctions in experiences for various cultural groups, we will present four cultural identity models—-*Minority, Majority, Bi-racial, and Global Nomads.*

Minority Identity Development

Acculturation is a process of social, psychological, and cultural change that stems from the balancing of two cultures while adapting to the prevailing culture of the society. Acculturation is a process in which an individual adopts, acquires, and adjusts to a new cultural environment. Individuals of a differing culture try to incorporate themselves into the more prevalent culture by participating in aspects of the more prevalent culture, such as their traditions, but still hold onto their original cultural values and

traditions. The effects of acculturation can be seen at multiple levels in both the devotee of the prevailing culture and those who are assimilating into the culture (Cole, 2018).

At the individual level, the process of acculturation refers to the socialization process by which someone from outside of the dominant culture blends the values, customs, norms, cultural attitudes, and behaviors of the dominant culture. This process has been linked to changes in daily behavior, as well as numerous changes in psychological and physical well-being. As enculturation is used to describe the process of first-culture learning, acculturation can be thought of as second-culture learning.

The fourfold model is a bilinear model that categorizes acculturation strategies along two dimensions. The first dimension concerns the retention or rejection of an individual's minority or native culture (i.e. "Is it considered to be of value to maintain one's identity and characteristics?"). Whereas the second dimension concerns the adoption or rejection of the dominant group or host culture. ("Is it considered to be of value to maintain relationships with the larger society?") From this, four acculturation strategies emerge (Berry, 1997).

		Attitude toward individual's minority culture	
		Rejection	Retention
Attitude toward dominant group culture	Adopt	Assimilation	Integration
	Reject	Marginalization	Separation

Figure 1. Berry's acculturation model.

- **Assimilation** occurs when individuals adopt the cultural norms of a dominant or host culture over their original culture. Sometimes this is forced by the dominant culture.
- **Separation** occurs when individuals reject the dominant or host culture in favor of preserving their culture of origin. Separation is often facilitated by immigration to ethnic enclaves.
- **Integration** occurs when individuals can adopt the cultural norms of the dominant or host culture while maintaining their culture of origin. Integration leads to, and is often synonymous with, biculturalism.
- **Marginalization** occurs when individuals reject both their culture of origin and the dominant culture.

Studies suggest that individuals' respective acculturation strategies can differ between their private and public life spheres (Arends-Tóth & van de Vijver, 2004). For instance, an individual may reject the values and norms of the dominant culture in his private life (separation), while simultaneously adapting to the dominant culture in public parts of his life (i.e., integration or assimilation).

Because people who identify as members of a minority group in the United States tend to stand out or get noticed as "other" or "different," they also tend to become aware of their identity sooner than individuals who are part of the majority group. For many ethnic minority teens, discovering one's ethnic identity is an integral part of identity formation. Phinney (1989) proposed a model of ethnic identity development that included stages of unexplored ethnic identity, ethnic identity search, and achieved ethnic identity.

Stage 1: Unexamined Identity. As the name of this stage suggests, the person in stage one of Phinney's model has little or no concern with ethnicity. They may be too young to pay attention to such matters or just not see the relationship between racial identity and

their own life. One may accept the values and beliefs of the majority culture, even if they work against their cultural group.

Stage 2: Conformity. In stage two, the individual moves from a passive acceptance of the dominant culture's value system to a more active one. They consciously make choices to assimilate or fit in with the dominant culture even if this means putting down or denying their heritage. They may remain at this stage until a precipitating event forces them to question their belief system.

Stage 3: Resistance and Separation. The move from stage two to stage three can be a complicated process as it necessitates a certain level of critical thinking and self-reflection. If you have ever tried to wrestle with aspects of your belief system, then you can imagine the struggle. The move may be triggered by a national event such as the case of "Michael Brown, an unarmed black teenager, was shot and killed on August 9, by Darren Wilson, a white police officer, in Ferguson, MO (Buchanan). It may be fostered on a more individual scale, such as enrolling in a Women's Studies class and learning about the specifics of women's history in America. Martin Luther King Jr. moved to this stage around age six after the mother of King's White neighborhood friends told them that he could not play with her children anymore because he was Black. A person in this stage may simply reject all of their previously held beliefs and positive feelings about the dominant culture with those of their group, or they may learn how to critically examine and hold beliefs from a variety of cultural perspectives, which leads to stage four.

Stage 4: Integration. The final stage is one where the individual reaches an achieved identity. They learn to value diversity, seeing race, gender, class, and ethnic relations as a complex process instead of an either/or dichotomy. Their aim is to end oppression against all groups, not just their own.

Majority Identity Development

Since White is still considered normative in the United States, White people may take their identity and the corresponding privilege for granted. While we are using the following four stages of development to refer to racial and ethnic identity development, they may also be useful when considering other minority aspects of our identity, such as gender, class, or sexual orientation. Moreover, there is no set age or time period that a person reaches or spends in a particular stage, and not everyone will reach the final stage.

The following model was developed by Rita Hardiman (1994) and contains some similarities with Phinney's minority identity development model.

Stage 1: Unexamined Identity. This stage is the same for both minority and majority individuals. While children may notice that some of their playmates have different colored skin, they do not fear or feel superior to them.

Stage 2: Acceptance. The move to stage two signals a passive or active acceptance of the dominant ideology—either way, the individual does not recognize that he or she has been socialized into accepting it. When a White person goes the route of passive acceptance, they have no conscious awareness of being White. However, they may hold some subtly racist assumptions such as "[p]eople of color are culturally different, whereas Whites are individuals with no group identity, culture, or shared experience of racial privilege." Alternatively, White art forms are "classical," whereas works of art by people of color are considered "ethnic art," "folk art," or "crafts" (Martin and Nakayama 132). People in this stage may minimize contact with minorities or act in a "let me help you" fashion toward them. If a White person in this stage follows the active acceptance path, then they are conscious of their White identity and may act in ways that highlight it. Refusing to eat food from other cultures or watch foreign films are examples of the active acceptance path.

Stage 3: Resistance. Just as the move from stage two to stage three in the minority development model required a great deal of critical thought, so does this juncture. Here the members of the majority group cease blaming the members of minority groups for their conditions and see socioeconomic realities as a result of an unjust and biased sociopolitical system. There is an overall move from seeing one's station in life as a purely individual event or responsibility to a more systemic issue. Here, people may feel guilty about being White and ashamed of some of the historical actions taken by some White people. They may try to associate with only people of color, or they may attempt to exorcise aspects of White privilege from their daily lives.

Stage 4: Redefinition. In this stage, people attempt to redefine what it means to be White without the racist baggage. They can move beyond White guilt and recognize that White people and people of all cultures contain both racist and nonracist elements and that there are many historical and cultural events of which White people can be proud.

Stage 5: Integration. In the last phase, individuals can accept their Whiteness or other majority aspects of their identity and integrate it into other parts of their lives. There are simultaneous self-acceptance and acceptance of others.

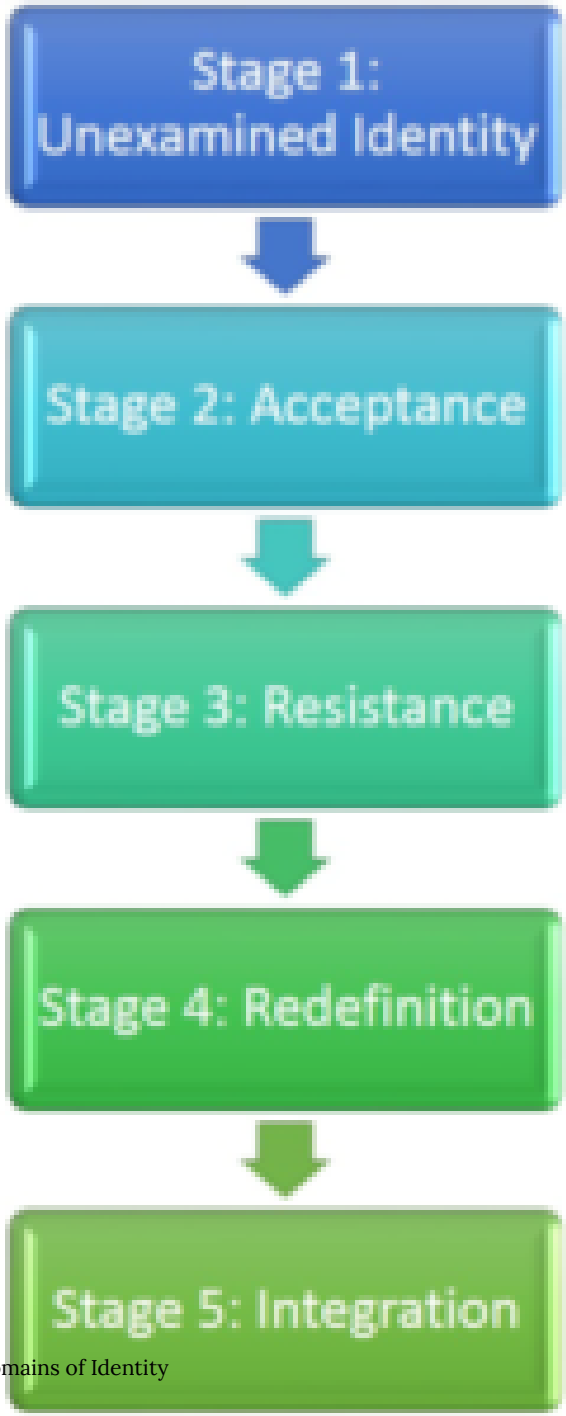
Stage 1: Unexamined Identity
Stage 2: Acceptance
Stage 3: Resistance
Stage 4: Redefinition
Stage 5: Integration

Figure 2. Hardiman's stages of majority identity development

Bi- or Multiracial Identity Development

Originally, people thought that bi-racial individuals followed the development model of minority individuals. However, given that we now know that race is a social construct, it makes sense to realize that a person of mixed racial ancestry is likely to be viewed differently (from both the dominant culture and the individual's own culture) than a minority individual. Thus, they are likely to experience a social reality unique to their experience. The following five-stage model is derived from the work of W.S. Carlos Poston.

Stage 1: Personal Identity. Poston's first stage is much like the unexamined identity stage in the previous two models. Again, children are not aware of race as a value-based social category and derive their personal identity from individual personality features instead of cultural ones.

Stage 2: Group Categorization. In the move from stage one to two, the person goes from no racial or cultural awareness to having to choose between one or the other. In a family where the father is Black, and the mother is Japanese, the child may be asked by members of both families to decide if he or she is Black or Japanese. Choosing both is not an option at this stage.

Stage 3: Enmeshment/Denial. Following the choice made in stage two, individuals attempt to immerse themselves in one culture while denying ties to the other. This process may result in guilt or feelings of distance from the parent and family whose culture was rejected in stage two. If these feelings are resolved, then the child moves to the next stage. If not, they remain here.

Stage 4: Appreciation. When feelings of guilt and anger are resolved, the person can work to appreciate all of the cultures that shape their identity. While there is an attempt to learn about the

diversity of their heritage, they will still identify primarily with the culture chosen in stage two.

Stage 5: Integration. In the fifth and final stage, the once fragmented parts of the person's identity are brought together to create a unique whole. There is an integration of cultures throughout all facets of a person's life—dress, food, holidays, spirituality, language, and communication.

Global Nomads

People who move around a lot may develop a multicultural identity as a result of their extensive international travel. International teachers, business people, and military personnel are examples of global nomads (Martin & Nakayama). One of the earlier theories to describe this model of development was called the U-curve theory because the stages were thought to follow the pattern of the letter U. The model has since been revised in the form of a W or a series of ups and downs. This pattern is thought better to represent the up and down nature of this process.

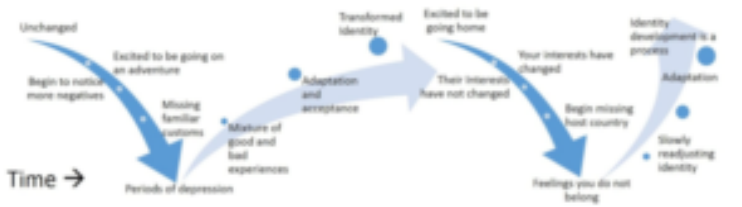

Figure 3. Identity development model for global nomads.

Stage 1: Anticipation and Excitement. If you have ever planned for an international trip, what were some of the things you did to prepare? Did you do something like buy a guidebook to learn some

of the native customs, figure out the local diet to see if you would need to make any special accommodations, learn the language, or at least some handy phrases perhaps? All of these acts characterize stage one in which people are filled with positive feelings about their upcoming journey and try to ready themselves.

Stage 2: Culture Shock. Once the excitement has worn off or you are confronted with an unexpected or unpleasant event, you may experience culture shock. This experience is the move from the top of the U or W to the bottom. Culture shock can result from physical, psychological, or emotional causes often correlating with an unpleasant and unfamiliar event. When individuals have spent most of their lives in a particular country, they will most likely experience culture shock when they travel overseas. The differences in cultural language, customs, and even food may be overwhelming to someone that has never experienced them before.

Stage 3: Adaptation. The final stage at the top of the U and W is a feeling of comfortableness: being somewhat familiar with the new cultural patterns and beliefs. After spending more time in a new country and learning its cultural patterns and beliefs, individuals may feel more welcomed into the society by accepting and adapting to these cultural differences.

Gender Identity, Gender Constancy, and Gender Roles

Gender identity is one's self-conception of their gender. Sex is the term to refer to the biological differences between males and females, such as genitalia and genetic differences. While gender

refers to the socially constructed characteristics of women and men, such as norms, roles, and relationships between groups of women and men. **Cisgender** is an umbrella term used to describe people whose sense of personal identity and gender corresponds with their birth sex, while **transgender** is a term used to describe people whose sense of personal identity does not correspond with their birth sex.

Gender expression, or how one demonstrates gender (based on traditional gender role norms related to clothing, behavior, and interactions), can be feminine, masculine, androgynous, or somewhere along a spectrum. Many adolescents use their analytic, hypothetical thinking to question traditional gender roles and expression. If their genetically assigned sex does not line up with their gender identity, they may refer to themselves as transgender, non-binary, or gender-nonconforming.

Preschool-aged children become increasingly interested in finding out the differences between boys and girls both physically and in terms of what activities are acceptable for each. While two-year-olds can identify some differences and learn whether they are boys or girls, preschoolers become more interested in what it means to be male or female. This self-identification, or gender identity, is followed sometime later with gender constancy, or the understanding that superficial changes do not mean that gender has actually changed. For example, if you are playing with a two-year-old boy and put barrettes in his hair, he may protest saying that he doesn't want to be a girl. By the time a child is four years old, they have a solid understanding that putting barrettes in their hair does not change their gender.

Children learn at a young age that there are distinct expectations for boys and girls. Cross-cultural studies reveal that children are aware of gender roles by age two or three. At four or five, most children are firmly entrenched in culturally appropriate gender roles (Kane 1996). Children acquire these roles through socialization, a process in which people learn to behave in a particular way as dictated by societal values, beliefs, and attitudes.

Children may also use gender stereotyping readily. Gender stereotyping involves overgeneralizing the attitudes, traits, or behavior patterns of women or men. A recent research study examined four- and five-year-old children's predictions concerning the sex of the persons carrying out a variety of common activities and occupations on television. The children's responses revealed strong gender-stereotyped expectations. They also found that children's estimates of their own future competence indicated stereotypical beliefs, with the females more likely to reject masculine activities.

Children who are allowed to explore different toys, who are exposed to non-traditional gender roles, and whose parents and caregivers are open to allowing the child to take part in non-traditional play (allowing a boy to nurture a doll, or allowing a girl to play doctor) tend to have broader definitions of what is gender appropriate, and may do less gender stereotyping.

Fluidity and uncertainty regarding sex and gender are especially common during early adolescence when hormones increase and fluctuate, creating a difficulty of self-acceptance and identity achievement (Reisner et al., 2016). Gender identity is becoming an increasingly prolonged task as attitudes and norms regarding gender keep changing. The roles appropriate for males and females are evolving, and some adolescents may foreclose on a gender identity as a way of dealing with this uncertainty by adopting more stereotypic male or female roles (Sinclair & Carlsson, 2013). Those that identify as transgender or 'other' face even more significant challenges.

Watch It

Video 2. This clip from Upworthy shows how some

children were surprised to meet women in traditionally male occupations.

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Stages of Gender Identity Development

The National Center on Parent, Family, and Community Engagement identified several stages of gender identity development, as outlined below.

Infancy. Children observe messages about gender from adults' appearances, activities, and behaviors. Most parents' interactions with their infants are shaped by the child's gender, and this in turn also shapes the child's understanding of gender (Fagot & Leinbach, 1989; Witt, 1997; Zosuls, Miller, Ruble, Martin, & Fabes, 2011).

18–24 months. Toddlers begin to define gender, using messages from many sources. As they develop a sense of self, toddlers look for patterns in their homes and early care settings. Gender is one way to understand group belonging, which is important for secure development (Kuhn, Nash & Brucken, 1978; Langlois & Downs, 1980; Fagot & Leinbach, 1989; Baldwin & Moses, 1996; Witt, 1997; Antill, Cunningham, & Cotton, 2003; Zoslus, et al., 2009).

Ages 3–4. Gender identity takes on more meaning as children

begin to focus on all kinds of differences. Children begin to connect the concept "girl" or "boy" to specific attributes. They form stronger rules or expectations for how each gender behaves and looks (Kuhn, Nash, & Brucken 1978; Martin, Ruble, & Szkrybalo, 2004; Halim & Ruble, 2010).

Ages 5-6. At these ages, children's thinking may be rigid in many ways. For example, 5- and 6-year-olds are very aware of rules and of the pressure to comply with them. They do so rigidly because they are not yet developmentally ready to think more deeply about the beliefs and values that many rules are based on. For example, as early educators and parents know, the use of "white lies" is still hard for them to understand. Researchers call these ages the most "rigid" period of gender identity (Weinraub et al., 1984; Egan, Perry, & Dannemiller, 2001; Miller, Lurye, Zosuls, & Ruble, 2009). A child who wants to do or wear things that are not typical of his gender is probably aware that other children find it strange. The persistence of these choices, despite the negative reactions of others, shows that these are strong feelings. Gender rigidity typically declines as children age (Trautner et al., 2005; Halim, Ruble, Tamis-LeMonda, & Shrout, 2013). With this change, children develop stronger moral impulses about what is "fair" for themselves and other children (Killen & Stangor, 2001).

It is important to understand these typical and normal attempts for children to understand the world around them. It is helpful to encourage children and support them as individuals, instead of emphasizing or playing into gender roles and expectations. You can foster self-esteem in children of any gender by giving all children positive feedback about their unique skills and qualities. For example, you might say to a child, "I noticed how kind you were to your friend when she fell down" or "You were very helpful with clean-up today—you are such a great helper" or "You were such a strong runner on the playground today."

Encouraging Healthy Gender Development

You can see more of their resources and tips for healthy gender development by reading Healthy Gender Development and Young Children.

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Theories of Gender Identity Development

Biological Approach

The biological approach explores how gender identity development is influenced by genetics, biological sex characteristics, brain development, and hormone exposure.

Humans usually have 23 pairs of chromosomes, each containing thousands of genes that govern various aspects of our development. The 23rd pair of chromosomes are called the sex chromosomes. This pair determines a person's sex, among other functions. Most often, if a person has an XX pair, they will develop into a female, and if they have an XY pair, they will be male.

Around the sixth week of prenatal development, the SRY gene on the Y chromosome signals the body to develop as a male. This chemical signal triggers a cascade of other hormones that will tell the gonads to develop into testes. If the embryo does not have a Y or the if, for some reason, the SRY gene is missing or not activate, then the embryo will develop female characteristics. The baby is born and lives as a female, but genetically her chromosomes are XY. Rat studies have found that the reverse is also possible. Researchers implanted the SRY gene in rats with XX chromosomes, and the result was male baby mice.

Individuals with atypical chromosomes may also develop differently than their typical XX or XY counterparts. These chromosomal abnormalities include syndromes where a person may have only one sex chromosome or three sex chromosomes. Turner's Syndrome is a condition where a female has only one X chromosome (XO). This missing chromosome results in a female external appearance but lacking ovaries. These XO females do not mature through puberty like XX females and they may also have webbed skin around the neck. Cognitively, these females tend to have high verbal skills, poor spatial and math skills, and poor social adjustment.

Klinefelter's Syndrome is a condition where a male has an extra X chromosome (XXY). This XXY combination results in male genitals, although their genitals may be underdeveloped even into adulthood. Even after puberty, they tend to have less body and facial hair and may develop breasts. From infancy, these children often have a passive, cooperative, and shy personality that remains into adulthood. Cognitively, they are often late to talk and have poor language and reading skills.

As we learned in the physical development chapter, sex hormones cause biological changes to the body and brain. While the same-sex hormones are present in males and females, the amount of each hormone and the effect of that hormone on the body is different. Males have much higher levels of testosterone than females. In the womb, testosterone causes the development of male sex organs.

It also impacts the hypothalamus, causing an enlarged sexually dimorphic nucleus, and results in the 'masculinization' of the brain. Around the same time, testosterone may contribute to greater lateralization of the brain, resulting in the two halves working more independently of each other. Testosterone also affects what we often consider male behaviors, such as aggression, competitiveness, visual-spatial skills, and higher sex drive.

Cognitive Approaches

Cognitive learning theory states that children develop gender at their own levels. At each stage, the child thinks about gender characteristically. As a child moves forward through stages, their understanding of gender becomes more complex.

The following cognitive model, formulated by Kohlberg, asserts that children recognize their gender identity around age three but do not see it as relatively fixed until five to seven. This identity marker provides children with a schema, a set of observed or spoken rules for how social or cultural interactions should happen. Information about gender is gathered from the environment; thus, children look for role models to emulate maleness or femaleness as they grow.

Stage 1: Gender Labeling (2-3.5 years). The child can label their gender correctly.

Stage 2: Gender Stability (3.5-4.5 years). The child's gender remains the same across time.

Stage 3: Gender Constancy (6 years). The child's gender is independent of external features (e.g., clothing, hairstyle).

Once children form a basic gender identity, they start to develop gender schemas. These gender schemas are organized set of gender-related beliefs that influence behaviors. The formation of these schemas explains how gender stereotypes become so psychologically ingrained in our society.

According to Sandra Bem's Gender Schema Theory, gender schemas can be organized into four general categories. The **sex-type schema** is the belief that gender matches biological sex. **Sex-reversed schema** is when gender is the opposite of biological sex. Possessing both masculine and feminine traits is an **androgynous schema**. While possessing few masculine or feminine traits is an **undifferentiated schema**.

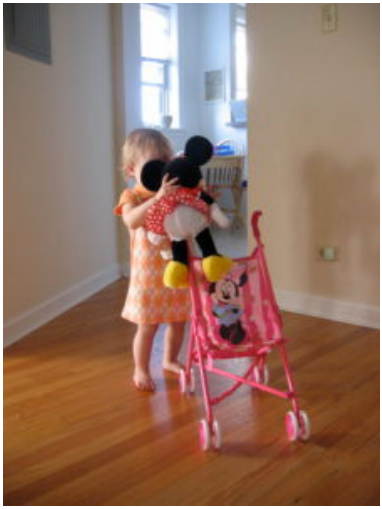
Social Learning Approach

Social Learning Theory suggests that gender role socialization is a result of how parents, teachers, friends, schools, religious institutions, media, and others send messages about what is acceptable or desirable behavior for males or females. if children receive positive reinforcement, they are motivated to continue a particular behavior. If they receive punishment or other indicators of disapproval, they are motivated to stop that behavior. In terms of gender development, children receive praise if they engage in culturally appropriate gender displays and punishment if they do not. When aggressiveness in boys is met with acceptance or a "boys will be boys" attitude, but a girl's aggressiveness earns them little attention, the two children learn different meanings for aggressiveness related to their gender development. Thus, boys may continue being aggressive while girls may drop it out of their repertoire.

This socialization begins early—in fact, it may even begin when a parent learns that a child is on the way. Knowing the sex of the child can conjure up images of the child's behavior, appearance, and potential on the part of a parent. And this stereotyping continues to guide perception through life. Consider parents of newborns. Shown a 7-pound, 20-inch baby, wrapped in blue (a color designating males) describe the child as tough, strong, and angry

when crying. Shown the same infant in pink (a color used in the United States for baby girls), these parents are likely to describe the baby as pretty, delicate, and frustrated when crying (Maccoby & Jacklin, 1987). Female infants are held more, talked to more frequently, and given direct eye contact, while male infants' play is often mediated through a toy or activity.

One way children learn gender roles is through play. Parents typically supply boys with trucks, toy guns, and superhero paraphernalia, active toys that promote motor skills, aggression, and solitary play. Daughters are often given dolls and dress-up apparel that foster nurturing, social proximity, and role play. Studies have shown that children will most likely choose to play with "gender appropriate" toys (or same-gender toys) even when cross-gender toys are available because parents give children positive feedback (in the form of praise, involvement, and physical closeness) for gender normative behavior (Caldera, Huston, and O'Brien 1998).



Sons are given tasks that take them outside the house and that have to be performed only on occasion, while girls are more likely to be given chores inside the home, such as cleaning or cooking, that are performed daily. Sons are encouraged to think for themselves when they encounter problems, and daughters are more likely to be given assistance even when they are working on an answer. This impatience is reflected in teachers waiting less time when asking a female student for an answer than when asking for a reply from a male student (Sadker and Sadker, 1994). Girls are given the message from teachers that they must try harder and endure in order to succeed

while boys' successes are attributed to their intelligence. Of course, the stereotypes of advisors can also influence which kinds of courses or vocational choices girls and boys are encouraged to make.

Friends discuss what is acceptable for boys and girls, and popularity may be based on modeling what is considered ideal behavior or appearance for the sexes. Girls tend to tell one another secrets to validate others as best friends, while boys compete for position by emphasizing their knowledge, strength or accomplishments. This focus on accomplishments can even give rise to exaggerating accomplishments in boys, but girls are discouraged from showing off and may learn to minimize their accomplishments as a result.

Gender messages abound in our environment. But does this mean that each of us receives and interprets these messages in the same way? Probably not. In addition to being recipients of these cultural expectations, we are individuals who also modify these roles (Kimmel, 2008).

One interesting recent finding is that girls may have an easier time breaking gender norms than boys. Girls who play with masculine toys often do not face the same ridicule from adults or peers that boys face when they want to play with feminine toys. Girls also face less ridicule when playing a masculine role (like doctor) as opposed to a boy who wants to take a feminine role (like caregiver).

The Impact of Gender Discrimination

How much does gender matter? In the United States, gender differences are found in school experiences. Even in college and professional school, girls are less vocal in class and much more at risk for sexual harassment from teachers, coaches, classmates, and professors. These gender differences are also found in social

interactions and in media messages. The stereotypes that boys should be strong, forceful, active, dominant, and rational, and that girls should be pretty, subordinate, unintelligent, emotional, and talkative are portrayed in children's toys, books, commercials, video games, movies, television shows, and music. In adulthood, these differences are reflected in income gaps between men and women (women working full-time earn about 74 percent of the income of men), in higher rates of women suffering rape and domestic violence, higher rates of eating disorders for females, and in higher rates of violent death for men in young adulthood.

Gender differences in India can be a matter of life and death as preferences for male children have been historically strong and are still held, especially in rural areas (WHO, 2010). Male children are given preference for receiving food, breast milk, medical care, and other resources. In some countries, it is no longer legal to give parents information on the sex of their developing child for fear that they will abort a female fetus. Clearly, gender socialization and discrimination still impact development in a variety of ways across the globe. Gender discrimination generally persists throughout the lifespan in the form of obstacles to education, or lack of access to political, financial, and social power.

Transgender Identity Development

Individuals who identify with a role that is different from their biological sex are called **transgender**. Approximately 1.4 million U.S. adults or .6% of the population are transgender, according to a 2016 report (Flores et al., 2016).

Transgender individuals may choose to alter their bodies through medical interventions such as surgery and hormonal therapy so that their physical being is better aligned with gender identity. They may also be known as male-to-female (MTF) or female-to-male (FTM). Not all transgender individuals choose to alter their bodies; many

will maintain their original anatomy but may present themselves to society as another gender. This expression is typically done by adopting the dress, hairstyle, mannerisms, or other characteristics typically assigned to another gender. It is important to note that people who cross-dress or wear clothing that is traditionally assigned to a different gender is not the same as identifying as transgender. Cross-dressing is typically a form of self-expression, entertainment, or personal style, and it is not necessarily an expression against one's assigned gender (APA 2008).

After years of controversy over the treatment of sex and gender in the American Psychiatric Association Diagnostic and Statistical Manual for Mental Disorders (Drescher 2010), the most recent edition, DSM-5, responded to allegations that the term "gender identity disorder" is stigmatizing by replacing it with "**gender dysphoria**." Gender identity disorder as a diagnostic category stigmatized the patient by implying there was something "disordered" about them. Removing the word "disorder" also removed some of the stigmas while still maintaining a diagnosis category that will protect patient access to care, including hormone therapy and gender reassignment surgery.

In the DSM-5, gender dysphoria is a condition of people whose gender at birth is contrary to the one with which they identify. For a person to be diagnosed with gender dysphoria, there must be a marked difference between the individual's expressed/experienced gender and the gender others would assign him or her, and it must continue for at least six months. In children, the desire to be of the other gender must be present and verbalized (APA, 2013). Changing the clinical description may contribute to greater acceptance of transgender people in society. A 2017 poll showed that 54% of Americans believe gender is determined by sex at birth, and 32% say society has "gone too far" in accepting transgender people; views are sharply divided along political and religious lines (Salam, 2018).

Many psychologists and the transgender community are now advocating an affirmative approach to transgender identity development. This approach advocates that gender non-conformity

is not a pathology but a normal human variation. Gender non-conforming children do not systemically need mental health treatment if they are not "pathological." However, caregivers of gender non-conforming children can benefit from a mixture of psycho-educational and community-oriented interventions. Some children or teens may benefit from counseling or other interventions to help them cope with familial or societal reactions to their gender nonconformity.

Studies show that people who identify as transgender are twice as likely to experience assault or discrimination as non-transgender individuals; they are also one and a half times more likely to experience intimidation (National Coalition of Anti-Violence Programs 2010; Giovanniello, 2013). Trans women of color are most likely to be victims of abuse. There are also systematic aggressions, such as "deadnaming," (whereby trans people are referred to by their birth name and gender), laws restricting transpersons from accessing gender-specific facilities (e.g., bathrooms), or denying protected-class designations to prevent discrimination in housing, schools, and workplaces. Organizations such as the National Coalition of Anti-Violence Programs and Global Action for Trans Equality work to prevent, respond to, and end all types of violence against transgender and homosexual individuals. These organizations hope that by educating the public about gender identity and empowering transgender individuals, this violence will end.

Like other domains of identity, stage models for transgender identity development have helped describe a typical progression in identity formation. Lev's Transgender Emergence Model looks at how trans people come to understand their identity. Lev is working from a counseling/therapeutic point of view, thus this model talks about what the individual is going through and the responsibility of the counselor.

Stage 1: Awareness. In this first stage of awareness, gender-variant people are often in great distress; the therapeutic task is

the normalization of the experiences involved in emerging as transgender.

Stage 2: Seeking Information/Reaching Out. In the second stage, gender-variant people seek to gain education and support about transgenderism; the therapeutic task is to facilitate linkages and encourage outreach.

Stage 3: Disclosure to Significant Others. The third stage involves the disclosure of transgenderism to significant others (spouses, partners, family members, and friends); the therapeutic task involves supporting the transgender person's integration in the family system.

Stage 4: Exploration (Identity & Self-Labeling). The fourth stage involves the exploration of various (transgender) identities; the therapeutic task is to support the articulation and comfort with one's gendered identity.

Stage 5: Exploration (Transition Issues & Possible Body Modification). The fifth stage involves exploring options for transition regarding identity, presentation, and body modification; the therapeutic task is the resolution of the decision and advocacy toward their manifestation.

Stage 6: Integration (Acceptance & Post-Transition Issues). In the sixth stage, the gender-variant person can integrate and synthesize (transgender) identity; the therapeutic task is to support adaptation to transition-related issues.

Sexual Identity

Sexual identity is how one thinks of oneself in terms of to whom one is romantically or sexually attracted (Reiter, 1989). Sexual identity may also refer to **sexual orientation identity**, which is when people identify or dis-identify with a sexual orientation or choose not to identify with a sexual orientation (APA, 2009). Sexual identity and sexual behavior are closely related to sexual orientation

but they are distinguished (Reiter, 1989), with *identity* referring to an individual's conception of themselves, *behavior* referring to actual sexual acts performed by the individual, and *sexual orientation* referring to romantic or sexual attractions toward persons of the opposite sex or gender, the same sex or gender, to both sexes or more than one gender, or no one.

Sexual orientation is typically discussed as four categories: *heterosexuality*, the attraction to individuals of the other sex; *homosexuality*, the attraction to individuals of the same sex; *bisexuality*, the attraction to individuals of either sex; and *asexuality*, no attraction to either sex. However, others view sexual orientation as less categorical and more of a continuum.

Alfred Kinsey was among the first to conceptualize sexuality as a continuum rather than a strict dichotomy of gay or straight. He created a six-point rating scale that ranges from exclusively heterosexual to exclusively homosexual (Figure 4). In his 1948 work, *Sexual Behavior in the Human Male*, Kinsey writes, "Males do not represent two discrete populations, heterosexual and homosexual. The world is not to be divided into sheep and goats … The living world is a continuum in each and every one of its aspects" (Kinsey, 1948).

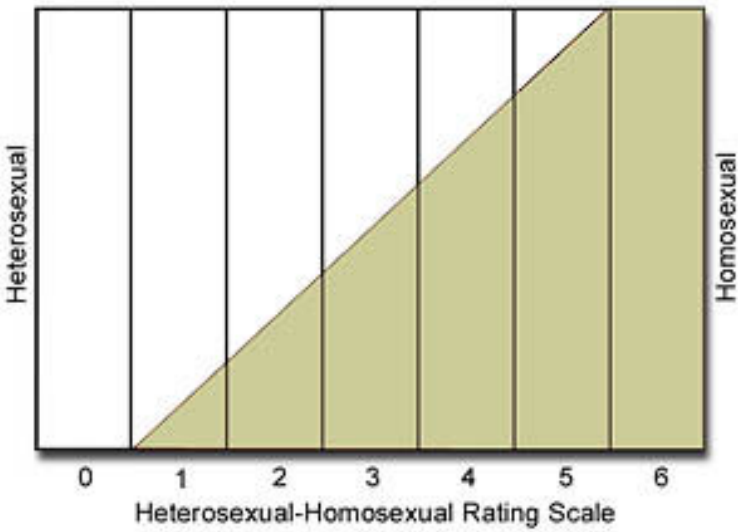


Figure 4. The Kinsey scale indicates that sexuality can be measured by more than just heterosexuality and homosexuality.

Later scholarship by Eve Kosofsky Sedgwick expanded on Kinsey's notions. She coined the term "homosocial" to oppose "homosexual," describing nonsexual same-sex relations. Sedgwick recognized that in U.S. culture, males are subject to a clear divide between the two sides of this continuum, whereas females enjoy more fluidity. This difference can be illustrated by the way women in the United States can express homosocial feelings (nonsexual regard for people of the same sex) through hugging, handholding, and physical closeness. In contrast, U.S. males refrain from these expressions since they violate the heteronormative expectation that male sexual attraction should be exclusively for females. Research suggests that it is easier for women to violate these norms than men because men are subject to more social disapproval for being physically close to other men (Sedgwick, 1985).

The issue of sexual identity and orientation can be further complicated when considering differences in romantic attraction

versus sexual attraction. A person could be romantically interested in the same sex, different sex, or any gender but could feel sexually attracted to the same or different group. For example, an individual could be interested in a romantic relationship with males but be sexually attracted to males and females. Alternatively, someone may be open to a romantic relationship with any gender but is primarily only sexually attracted to one sex.

The United States is a **heteronormative society**, meaning it assumes that heterosexuality is the norm and that sexual orientation is biologically determined and unambiguous. Consider that homosexuals are often asked, "When did you know you were gay?" but heterosexuals are rarely asked, "When did you know that you were straight?" (Ryle 2011). However, there is no scientific consensus regarding the exact reasons why an individual holds a particular sexual orientation. Research has been conducted to study the possible genetic, hormonal, developmental, social, and cultural influences on sexual orientation, but there has been no definitive evidence that links sexual orientation to one factor (APA, 2008).

According to current understanding, individuals are usually aware of their sexual orientation between middle childhood and early adolescence (APA, 2008). They do not have to participate in sexual activity to be aware of these emotional, romantic, and physical attractions; people can be celibate and still recognize their sexual orientation. Homosexual women (also referred to as lesbians), homosexual men (also referred to as gays), and bisexuals of both genders may have very different experiences of discovering and accepting their sexual orientation. At the point of puberty, some may be able to announce their sexual orientations, while others may be unready or unwilling to make their homosexuality or bisexuality known since it goes against U.S. society's historical norms (APA 2008).

Most of the research on sexual orientation identity development focuses on the development of people who are attracted to the same sex. Many people who feel attracted to members of their own sex 'come out' at some point in their lives. *Coming out* is described

in three phases. The first phase is the phase of "knowing oneself," and the realization emerges that one is sexually and emotionally attracted to members of one's own sex. This step is often described as an internal coming out and can occur in childhood or at puberty, but sometimes as late as age 40 or older. The second phase involves a decision to come out to others, e.g., family, friends, and/or colleagues. The third phase involves living openly as an LGBT person (Human Rights Campaign, 2007). In the United States today, people often come out during high school or college age. At this age, they may not trust or ask for help from others, especially when their orientation is not accepted in society. Sometimes they do not inform their own families.

According to Rosario, Schrimshaw, Hunter, Braun (2006), "the development of a lesbian, gay, or bisexual (LGB), sexual identity is a complex and often difficult process. Unlike members of other minority groups (e.g., ethnic and racial minorities), most LGB individuals are not raised in a community of similar others from whom they learn about their identity. Their identity may not be reinforced and supported by their community. Instead, "LGB individuals are often raised in communities that are either ignorant of or openly hostile toward homosexuality."

Cass' Homosexual Identity Model

Cass (1979) was one of the early creators of a model for explaining how individuals progress through the development of a homosexual identity. Cass proposed six stages. It may take several years to get through a particular stage and not all make it to stage 6. "Foreclosure" (when an individual denies their identity or hides it from others) can occur at any stage and halt the process.

Stage 1: Identity Awareness. The individual is aware of being "different" from others.

Stage 2: Identity Comparison. The individual compares their feelings and emotions to those they identify as heterosexual.

Stage 3: Identity Tolerance. The individual tolerates their identity as being non-heterosexual.

Stage 4: Identity Acceptance. The individual accepts their new identity and begins to become active in the "gay community."

Stage 5: Identity Pride. The individual becomes proud of their identity and becomes fully immersed in "gay culture."

Stage 6: Identity Synthesis. The individual fully accepts their identity and synthesizes their former "heterosexual life" and their new identity.

A criticism of Cass' model is that her research primarily studied white gay men and lesbian women of middle- to upper-class status. This stage model is not necessarily reflective of the process a bisexual or transgender individual may experience and, ultimately, may not be reflective of the process experienced by all non-heterosexual individuals.

Some individuals with unwanted sexual attractions may choose to actively dis-identify with a sexual minority identity, which creates a different sexual orientation identity from their actual sexual orientation. Sexual orientation identity, but not sexual orientation, can change through psychotherapy, support groups, and life events. A person who has homosexual feelings can self-identify in various ways. An individual may come to accept an LGB identity, to develop a heterosexual identity, to reject an LGB identity while choosing to identify as ex-gay, or to refrain from specifying a sexual identity (APA, 2009).

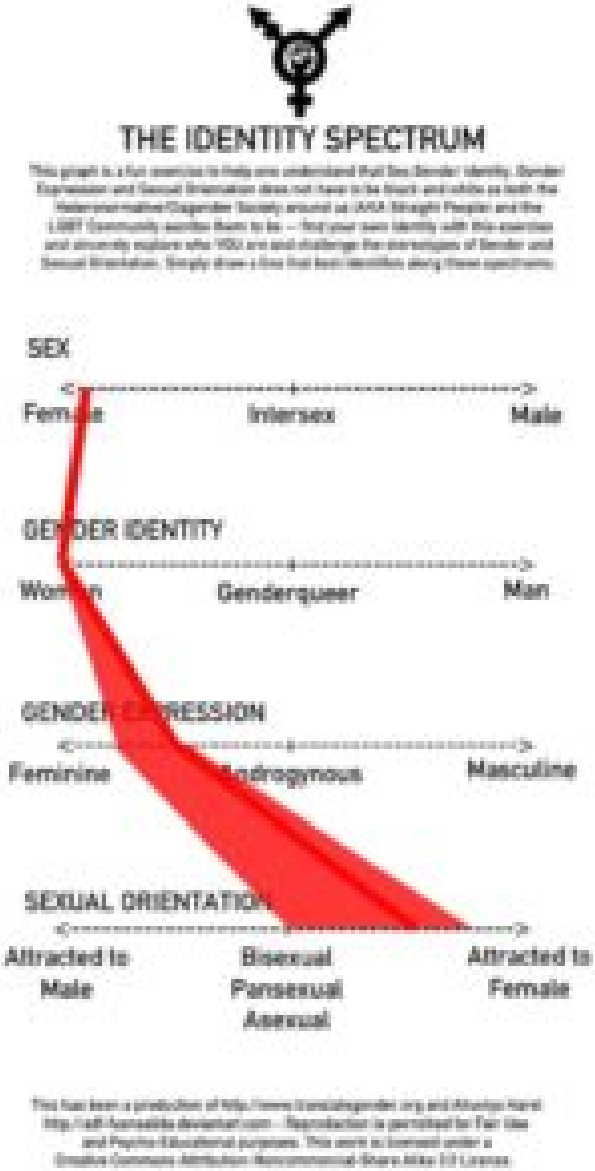

THE IDENTITY SPECTRUM
SEX
Intersex
Male
Genderqueer
Man
Feminine
Masculine
SEXUAL ORIENTATION
Attracted to Male
Bisexual
Pansexual
Asexual
Attracted to Female

Figure 5. This identity spectrum shows the fluidity between sex, gender identity, gender expression, and sexual orientation.

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Video 3. *Demographic Structure of Society–Sex, Gender, and Sexual Orientation* explains various aspects of gender and sexual identity.

Ideological Group Identity

Religious identity is a specific type of identity formation. Particularly, it is the sense of group membership to a religion and the importance of this group membership as it pertains to one's self-concept. Religious identity is not necessarily the same as religiousness or religiosity. Although these terms share a commonality, religiousness and religiosity refer to both the value of religious group membership as well as participation in religious events (e.g., going to church) (Arweck & Nesbitt, 2010; King et al., 1997). Religious identity, on the other hand, refers specifically to religious group membership regardless of religious activity or participation.

Similar to other forms of identity formation, such as ethnic and cultural identity, the religious context can generally provide a perspective from which to view the world, opportunities to socialize with a spectrum of individuals from different generations, and a set of fundamental principles to live out (King

& Boratzis, 2004). These foundations can come to shape an individual's identity.

The religious views of teens are often similar to those of their families (Kim-Spoon, Longo, & McCullough, 2012). Most teens may question specific customs, practices, or ideas in the faith of their parents, but few reject the religion of their families entirely.

An adolescent's political identity is also influenced by their parents' political beliefs. A new trend in the 21st century is a decrease in party affiliation among adults. Many adults do not align themselves with either the democratic or republican party, and their teenage children reflect their parents' lack of party affiliation. Although adolescents do tend to be more liberal than their elders, especially on social issues (Taylor, 2014), like other aspects of identity formation, adolescents' interest in politics is predicted by their parents' involvement and by current events (Stattin et al., 2017).

Occupational Identity Development

While adolescents in earlier generations envisioned themselves as working in a particular job and often worked as an apprentice or part-time in such occupations as teenagers, this is rarely the case today. Occupational identity takes longer to develop, as most of today's occupations require specific skills and knowledge that will require additional education or are acquired on the job itself. Besides, many of the jobs held by teens are not in occupations that most teens will seek as adults. (See career development theories for more information).

Family Life

One of the ways to assess the quality of family life is to consider the tasks of families.

Berger (2005) lists five family functions:

1. Providing food, clothing, and shelter
2. Encouraging Learning
3. Developing self-esteem
4. Nurturing friendships with peers
5. Providing harmony and stability

Notice that in addition to providing food, shelter, and clothing, families are responsible for helping the child learn, relate to others, and have a confident sense of self. The family provides a harmonious and stable environment for living. A good home environment is one in which the child's physical, cognitive, emotional, and social needs are adequately met. Sometimes families emphasize physical needs, but ignore cognitive or emotional needs. Other times, families pay close attention to physical needs and academic requirements, but may fail to nurture the child's friendships with peers or guide the child toward developing healthy relationships. Parents might want to consider how it feels to live in the household. Is it stressful and conflict-ridden? Is it a place where family members enjoy being?

Parenting Styles

Relationships between parents and children continue to play a significant role in children's development during early childhood. We will explore two models of parenting styles. Keep in mind that most parents do not follow any model completely. Real people tend to fall somewhere in between these styles. And sometimes parenting styles change from one child to the next or in times when the parent has more or less time and energy for parenting. Parenting styles can also be affected by concerns the parent has in other areas of their life. For example, parenting styles tend to become more authoritarian when parents are tired and perhaps more authoritative when they are more energetic. Sometimes parents seem to change their parenting approach when others are around, maybe because they become more self-conscious as parents or are concerned with giving others the impression that they are a "tough" parent or an "easy-going" parent. And of course, parenting styles may reflect the type of parenting someone saw modeled while growing up.

Baumrind's Parenting Styles

Baumrind (1971) offers a model of parenting that includes three

styles. The first, **authoritarian**, is the traditional model of parenting in which parents make the rules and children are expected to be obedient. Baumrind suggests that authoritarian parents tend to place maturity demands on their children that are unreasonably high and tend to be aloof and distant. Consequently, children reared in this way may fear rather than respect their parents and, because their parents do not allow discussion, may take out their frustrations on safer targets – perhaps as bullies toward peers.

Permissive parenting involves being a friend to a child rather than an authority figure. Children are allowed to make their own rules and determine their own activities. Parents are warm and communicative but provide little structure for their children. Children may fail to learn self-discipline and may feel somewhat insecure because they do not know the limits.

Authoritative parenting involves being appropriately strict, reasonable, and affectionate. Parents allow negotiation where appropriate and discipline matches the severity of the offense. A popular parenting program that is offered in many school districts is called "Love and Logic" and reflects the authoritative or democratic style of parenting just described.

Today we recognize a fourth style within the Baumrind framework: **uninvolved parenting.** These parents are disengaged from their children. They do not make demands on their children and are non-responsive. These children can suffer in school and in their relationships with their peers (Gecas & Self, 1991).

		Expectations/Control	
		Low	High
Warmth/ Responsiveness	Low	uninvolved	authoritarian
	High	permissive	authoritative

Figure 1. *Parents who are both warm and responsive while still maintaining a high level of control are considered authoritative.*

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=106#oembed-1

Lemasters and Defrain's Parenting Model

Lemasters and Defrain (1989) offered yet another model of parenting. This model is interesting because it looks more closely at the motivations of the parent and suggests that parenting styles are often designed to meet the psychological needs of the parent rather than the developmental needs of the child.

The **martyr** is a parent who will do anything for the child, even tasks that the child should do for himself or herself. All of the good

deeds performed for the child, in the name of being a "good parent," may be used later should the parent want to gain compliance from the child. If a child goes against the parent's wishes, the parent can remind the child of all of the times the parent helped the child and evoke a feeling of guilt so that the child will do what the parent wants. The child learns to be dependent and manipulative as a result. (Beware, a parent busy whipping up cookies may really be thinking "control"!)

The **pal** is like the permissive parent described in Baumrind's model above. The pal wants to be the child's friend. Perhaps the parent is lonely, or perhaps the parent is trying to win a popularity contest against an ex-spouse. Pals let children do what they want and focus most on being entertaining and fun. They set few limitations. Consequently, the child may have little self-discipline and may try to test limits with others.

The **police officer/drill sergeant** style of parenting is similar to the authoritarian parent described above. The parent focuses primarily on making sure that the child is obedient and that the parent has full control of the child. Sometimes this can be taken to extremes by giving the child tasks that are really designed to check on their level of obedience. For example, the parent may require that the child fold the clothes and place items back in the drawer in a particular way. If not, the child might be scolded or punished for not doing things "right." This type of parent has a very difficult time allowing the child to grow and learn to make decisions independently. And the child may have a lot of resentment toward the parent that is displaced on others.

The **teacher-counselor** parent is one who pays a lot of attention to expert advice on parenting and who believes that as long as all of the steps are followed, the parent can rear a perfect child. "What's wrong with that?" you might ask. There are two major problems with this approach. First, the parent is taking all of the responsibility for the child's behavior, at least indirectly. If the child has difficulty, the parent feels responsible and thinks that the solution lies in reading more advice and trying more diligently to follow that

advice. Parents can certainly influence children, but thinking that the parent is fully responsible for the child's outcome is faulty. A parent can only do so much and can never have full control over the child. Another problem with this approach is that the child may get an unrealistic sense of the world and what can be expected from others. For example, if a teacher-counselor parent decides to help the child build self-esteem and has read that telling the child how special he or she is or how important it is to compliment the child on a job well done, the parent may convey the message that everything the child does is exceptional or extraordinary. A child may come to expect that all of his efforts warrant praise, and in the real world, this is not something one can expect. Perhaps children get more of a sense of pride from assessing their own performance than from having others praise their efforts.

So what is left? Lemasters and Defrain (1989) suggest that the **athletic coach style of parenting** is best. Before you draw conclusions here, set aside any negative experiences you may have had with coaches in the past. The principles of coaching are what are important to Lemasters and Defrain. A coach helps players form strategies, supports their efforts, gives feedback on what went right and what went wrong, and stands at the sideline while the players perform. Coaches and referees make sure that the rules of the game are followed and that all players adhere to those rules. Similarly, the athletic coach as parent helps the child understand what needs to happen in certain situations whether in friendships, school, or home life and encourages and advises the child about how to manage these situations. The parent does not intervene or do things for the child. Rather, the parent's role is to provide guidance while the child learns first hand how to handle these situations. The rules for behavior are consistent and objective and presented in that way. So, a child who is late for dinner might hear the parent respond in this way, "Dinner was at six o'clock." Rather than, "You know good and well that we always eat at six. If you expect me to get up and make something for you now, you have got another thing

coming! Just who do you think you are showing up late and looking for food? You're grounded until further notice!"

The most important thing to remember about parenting is that you can be a better, more objective parent when you are directing your actions toward the child's needs while considering what they can reasonably be expected to do at their stage of development. Parenting is more difficult when you are tired and have psychological needs that interfere with the relationship. Some of the best advice for parents is to try not to take the child's actions personally, and be as objective as possible.

Class and Culture

The impact of class and culture cannot be ignored when examining parenting styles. The two models of parenting described above assume that authoritative and athletic coaching styles are best because they are designed to help the parent raise a child who is independent, self-reliant, and responsible. These are qualities favored in "individualistic" cultures such as the United States, particularly by the middle class.

Authoritarian parenting has been used historically and reflects the cultural need for children to do as they are told. African-American, Hispanic, and Asian parents tend to be more authoritarian than non-Hispanic whites. In collectivistic cultures such as China or Korea, being obedient and compliant are favored behaviors. In societies where family members' cooperation is necessary for survival, as in the case of raising crops, rearing children who are independent and who strive to be on their own makes no sense. But in an economy based on being mobile in order to find jobs and where one's earnings are based on education, raising a child to be independent is very important.

Working-class parents are more likely than middle-class parents to focus on obedience and honesty when raising their children. In

a classic study on social class and parenting styles called *Class and Conformity*, Kohn (1977) explained that parents tend to emphasize qualities that are needed for their own survival when parenting their children. Working-class parents are rewarded for being obedient, reliable, and honest in their jobs. They are not paid to be independent or to question the management; rather, they move up and are considered good employees if they show up on time, do their work as they are told, and can be counted on by their employers. Consequently, these parents reward honesty and obedience in their children. Middle-class parents who work as professionals are rewarded for taking initiative, being self-directed, and assertive in their jobs. They are required to get the job done without being told exactly what to do. They are asked to be innovative and to work independently. These parents encourage their children to have those qualities as well by rewarding independence and self-reliance. Parenting styles can reflect many elements of culture.

Link to Learning

Video 1. In Scout O'Donnell's TED Talk, she describes the alternative parenting style used by her parents. Can you find elements of authoritative and coaching parenting, along with a little Love and Logic?

One or more interactive elements has been excluded from this version of the text. You can view them online here:

https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=106#oembed-2

Parenting and Behaviorism

Parenting generally involves many opportunities to apply principles of behaviorism, especially operant conditioning. In discussing operant conditioning, we use several everyday words—positive, negative, reinforcement, and punishment—in a specialized manner. In operant conditioning, positive and negative do not mean good and bad. Instead, *positive* means you are adding something, and *negative* means you are taking something away. *Reinforcement* means you are increasing a behavior, and *punishment* means you are decreasing a behavior. Reinforcement can be positive or negative, and punishment can also be positive or negative. All reinforcers (positive or negative) *increase* the likelihood of a behavioral response. All punishers (positive or negative) *decrease* the likelihood of a behavioral response. Now let's combine these four terms: positive reinforcement, negative reinforcement, positive punishment, and negative punishment. (See table below.)

Table 1. Positive and Negative Reinforcement and Punishment

	Reinforcement	**Punishment**
Positive	Something is *added* to *increase* the likelihood of a behavior.	Something is *added* to *decrease* the likelihood of a behavior.
Negative	Something is *removed* to *increase* the likelihood of a behavior.	Something is *removed* to *decrease* the likelihood of a behavior.

The most effective way to teach a person or animal a new behavior is with positive reinforcement. In **positive reinforcement**, a stimulus is added to the situation to increase a behavior. Parents and teachers use positive reinforcement all the time, from offering dessert after dinner, praising children for cleaning their room or completing some work, offering a toy at the end of a successful piano recital, or earning more time for recess. The goal of providing these forms of positive reinforcement is to increase the likelihood of the same behavior occurring in the future.

Positive reinforcement is an extremely effective learning tool, as evidenced by nearly 80 years worth of research. That said, there are many ways to introduce positive reinforcement into a situation. Many people believe that reinforcers must be tangible, but research shows that verbal praise and hugs are very effective reinforcers for people of all ages. Further, research suggests that constantly providing tangible reinforcers may actually be counterproductive in certain situations. For example, paying children for their grades may undermine their intrinsic motivation to go to school and do well. While children who are paid for their grades may maintain good grades, it is to receive the reinforcing pay, not because they have an intrinsic desire to do well. The impact is especially detrimental to students who initially have a high level of intrinsic motivation to do well in school. Therefore, we must provide appropriate reinforcement, and be careful to ensure that the reinforcement does not undermine intrinsic motivation.

In **negative reinforcement**, an aversive stimulus is removed to increase a behavior. For example, car manufacturers use the

principles of negative reinforcement in their seatbelt systems, which go "beep, beep, beep" until you fasten your seatbelt. The annoying sound stops when you exhibit the desired behavior, increasing the likelihood that you will buckle up in the future. Negative reinforcement is also used frequently in horse training. Riders apply pressure—by pulling the reins or squeezing their legs—and then remove the pressure when the horse performs the desired behavior, such as turning or speeding up. The pressure is the negative stimulus that the horse wants to remove.

Sometimes, adding something to the situation is reinforcing as in the cases we described above with cookies, praise, and money. Positive reinforcement involves adding something to the situation in order to encourage a behavior. Other times, taking something away from a situation can be reinforcing. For example, the loud, annoying buzzer on your alarm clock encourages you to get up so that you can turn it off and get rid of the noise. Children whine in order to get their parents to do something and often, parents give in just to stop the whining. In these instances, children have used negative reinforcement to get what they want.

Operant conditioning tends to work best if you focus on trying to encourage a behavior or move a person into the direction you want them to go rather than telling them what not to do. Reinforcers are used to encourage behavior; punishers are used to stop the behavior. A punisher is anything that follows an act and decreases the chance it will reoccur. As with reinforcement, there are also two types of punishment: positive punishment and negative punishment.

Positive punishment involves adding something in order to decrease the likelihood that a behavior will occur again in the future. Spanking is an example of positive punishment. Receiving a speeding ticket is also an example of positive punishment. Both of these punishers, the spanking and the speeding ticket, are intended to decrease the reoccurrence of the related behavior.

Negative punishment involves removing something that is desired in order to decrease the likelihood that a behavior will

occur again in the future. Putting a child in time out can serve as a negative punishment if the child enjoys social interaction. Taking away a child's technology privileges can also be a negative punishment. Taking away something that is desired encourages the child to refrain from engaging in that behavior again in order to not lose the desired object or activity.

Often, punished behavior doesn't really go away. It is just suppressed and may reoccur whenever the threat of punishment is removed. For example, a child may not cuss around you because you've washed his mouth out with soap, but he may cuss around his friends. A motorist may only slow down when the trooper is on the side of the freeway. Another problem with punishment is that when a person focuses on punishment, they may find it hard to see what the other does right or well. Punishment is stigmatizing; when punished, some people start to see themselves as bad and give up trying to change.

Reinforcement can occur in a predictable way, such as after every desired action is performed (called continuous reinforcement), or intermittently, after the behavior is performed a number of times or the first time it is performed after a certain amount of time (called partial reinforcement whether based on the number of times or the passage of time). The schedule of reinforcement has an impact on how long a behavior continues after reinforcement is discontinued. So a parent who has rewarded a child's actions each time may find that the child gives up very quickly if a reward is not immediately forthcoming. Children will learn quickest under a continuous schedule of reinforcement. Then the parent should switch to a schedule of partial reinforcement to maintain the behavior.

Try It

Try this interactive to ensure you understand the differences between punishment and reinforcement. You'll see a few introductory slides that review the concepts and then answer some questions from parenting scenarios about what constitutes punishment (positive or negative) or reinforcement (positive or negative). Check your understanding of the final slide by placing the correct terms in the paragraph.

https://lumenlearning.h5p.com/content/1290850306672497978/embed

Everyday Connection: Behavior Modification in Children

Parents and teachers often use behavior modification to change a child's behavior. Behavior modification uses the principles of operant conditioning to accomplish behavior change so that undesirable behaviors are switched for more socially acceptable ones. Some teachers and parents create a sticker chart, in which several behaviors are listed. Sticker charts are a form of token economies. Each time children perform the behavior, they get a sticker, and after a certain

number of stickers, they get a prize or reinforcer. The goal is to increase acceptable behaviors and decrease misbehavior. Remember, it is best to reinforce desired behaviors, rather than to use punishment. In the classroom, the teacher can reinforce a wide range of behaviors, from students raising their hands, to walking quietly in the hall, to turning in their homework. At home, parents might create a behavior chart that rewards children for things such as putting away toys, brushing their teeth, and helping with dinner. In order for behavior modification to be effective, the reinforcement needs to be connected with the behavior; the reinforcement must matter to the child and be provided consistently.

Figure 2. *Sticker charts are a form of positive reinforcement and a tool for behavior modification. Once this little girl earns a certain number of stickers for demonstrating a desired behavior, she will be rewarded with a trip to the ice cream parlor. (credit: Abigail Batchelder)*

Time-out is another popular technique used in behavior modification with children. It operates on the principle of negative punishment. When a child demonstrates an undesirable behavior, she is removed from the desirable activity at hand. For example, say that Sophia and her brother Mario are playing with building blocks. Sophia throws some blocks at her brother, so you give her a warning that she will go to time-out if she does it again. A few minutes later, she throws more blocks at Mario. You remove Sophia from the room for a few minutes. When she comes back, she doesn't throw blocks.

There are several important points that you should know if you plan to implement time-out as a behavior modification technique. First, make sure the child is being removed from a desirable activity and placed in a less desirable location. If the activity is something undesirable for the child, this technique will backfire because it is more enjoyable for the child to be removed from the activity. Second, the length of the time-out is important. The general rule of thumb is one minute for each year of the child's age. Sophia is five; therefore, she sits in a time-out for five minutes. Setting a timer helps children know how long they have to sit in time-out. Finally, as a caregiver, keep several guidelines in mind over the course of a time-out: remain calm when directing your child to time-out; ignore your child during a time-out (because caregiver attention may reinforce misbehavior), and give the child a hug or a kind word when time-out is over.

(a) (b)

Figure 3*. Time-out is a popular form of negative punishment used by caregivers. When a child misbehaves, he or she is removed from a desirable activity in an effort to decrease unwanted behavior. For example, (a) a child might be playing on the playground with friends and push another child; (b) the child who misbehaved would then be removed from the activity for a short period of time. (credit a: modification of work by Simone Ramella; credit b: modification of work by "JefferyTurner"/Flickr)*

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=106#oembed-3

Child Care Concerns

About 75.7 percent of mothers of school-aged and 65.1 percent of mothers of preschool-aged children in the United States work outside the home. Since more women have been entering the

workplace, there has been a concern that families do not spend as much time with their children. This, however, may not be true. Between 1981 and 1997, the amount of time that parents spent with children increased overall (Sandberg and Hofferth, 2001). Modern numbers for this vary widely, as many parents who work outside of the home also devote significant amounts of time to childcare, to 14 hours a week, compared with 10 in 1965.

Seventy-five percent of children under age 5 are in scheduled child care programs. Others are cared for by family members, friends, or are in Head Start Programs. Older children are often in after-school programs, before school programs, or stay at home alone after school once they are older. Quality childcare programs can enhance a child's social skills and can provide rich learning experiences. But long hours in poor quality care can have negative consequences for young children in particular. What determines the quality of child care? One very important consideration is the teacher/child ratio. States specify the maximum number of children that can be supervised by one teacher. In general, the younger the children, the more teachers required for a given number of children. The lower the teacher-to-child ratio, the more time the teacher has for involvement with the children and the less stressed the teacher may be so that the interactions can be more relaxed, stimulating, and positive. The more children there are in a program, the less desirable the program as well. This is because the center may be more rigid in rules and structure to accommodate a large number of children in the facility.

The physical environment should be colorful, stimulating, clean, and safe. The philosophy of the organization and the curriculum available should be child-centered, positive, and stimulating. Providers should be trained in early childhood education as well. A majority of states do not require training for their child care providers. And while formal education is not required for a person to provide a warm, loving relationship to a child, knowledge of a child's development is useful for addressing their social, emotional, and cognitive needs in an effective way. By

working toward improving the quality of childcare and increasing family-friendly workplace policies, such as more flexible scheduling and perhaps childcare facilities at places of employment, we can accommodate families with smaller children and relieve parents of the stress sometimes associated with managing work and family life.

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Divorce

A lot of attention has been given to the impact of divorce on the life of children. The assumption has been that divorce has a strong, negative impact on the child and that single-parent families are deficient in some way. Research suggests 75-80 percent of children and adults who experience divorce suffer no long-term effects (Hetherington & Kelly, 2002). Children of divorce and children who have not experienced divorce are more similar than different (Hetherington & Kelly, 2002).

Mintz (2004) suggests that the alarmist view of divorce was due in part to the newness of divorce when rates in the United States began to climb in the late 1970s. Adults reacting to the change grew up in the 1950s when rates were low. As divorce has become more common and there is less stigma associated with divorce, this view has changed somewhat. Social scientists have operated from the divorce as a deficit model emphasizing the problems of being from a "broken home" (Seccombe &Warner, 2004). More recently,

a more objective view of divorce, repartnering, and remarriage indicates that divorce, remarriage, and life in stepfamilies can have a variety of effects. The exaggeration of the negative consequences of divorce has left the majority of those who do well hidden and subjected them to unnecessary stigma and social disapproval (Hetherington & Kelly, 2002).

The tasks of families listed above are functions that can be fulfilled in a variety of family types-not just intact, two-parent households. Harmony and stability can be achieved in many family forms and when it is disrupted, either through divorce, or efforts to blend families, or any other circumstances, the child suffers (Hetherington & Kelly, 2002).

Factors Affecting the Impact of Divorce

As you look at the consequences (both pro and con) of divorce and remarriage on children, keep these family functions in mind. Some negative consequences are a result of financial hardship rather than divorce per se (Drexler, 2005). Some positive consequences reflect improvements in meeting these functions. For instance, we have learned that positive self-esteem comes in part from a belief in the self and one's abilities rather than merely being complimented by others. In single-parent homes, children may be given more opportunities to discover their own abilities and gain independence that fosters self-esteem. If divorce leads to fighting between the parents and the child is included in these arguments, the self-esteem may suffer.

The impact of divorce on children depends on a number of factors. The degree of conflict prior to the divorce plays a role. If the divorce means a reduction in tensions, the child may feel relief. If the parents have kept their conflicts hidden, the announcement of a divorce can come as a shock and be met with enormous resentment. Another factor that has a great impact on the child

concerns financial hardships they may suffer, especially if financial support is inadequate. Another difficult situation for children of divorce is the position they are put into if the parents continue to argue and fight-especially if they bring the children into those arguments.

Short-term consequences: In roughly the first year following divorce, children may exhibit some of these short-term effects:

1. **Grief over losses suffered**. The child will grieve the loss of the parent they no longer see as frequently. The child may also grieve about other family members that are no longer available. Grief sometimes comes in the form of sadness, but it can also be experienced as anger or withdrawal. Preschool-aged boys may act out aggressively while the same-aged girls may become more quiet and withdrawn. Older children may feel depressed.
2. **Reduced Standard of Living**. Very often, divorce means a change in the amount of money coming into the household. Children experience new constraints on spending or entertainment. School-aged children, especially, may notice that they can no longer have toys, clothing, or other items to which they've grown accustomed, or it may mean that there is less eating out or canceling satellite television, and so on. The custodial parent may experience stress at not being able to rely on child support payments or having the same level of income as before. This can affect decisions regarding healthcare, vacations, rents, mortgages, and other expenditures. The stress can result in less happiness and relaxation in the home. The parent who has to take on more work may also be less available to

the children.

3. **Adjusting to Transitions**. Children may also have to adjust to other changes accompanying a divorce. The divorce might mean moving to a new home and changing schools or friends. It might mean leaving a neighborhood that has meant a lot to them as well.

Long-Term consequences: The following are some effects found after the first year of a divorce:

1. **Economic/Occupational Status**. One of the most commonly cited long-term effects of divorce is that children of divorce may have lower levels of education or occupational status. This may be a consequence of lower-income and resources for funding education rather than to divorce per se. In those households where economic hardship does not occur, there may be no impact on education or occupational status (Drexler, 2005).
2. **Improved Relationships with the Custodial Parent** (usually the mother): The majority of custodial parents are mothers (approximately 80.4 percent) and
19.6 percent of custodial parents are fathers. Shared custody is on the rise, however, and shows promising social, academic, and psychological results for the children. Children from single-parent families talk to their mothers more often than children of two-parent families (McLanahan and Sandefur, 1994). Most children of divorce lead happy, well-adjusted lives and develop stronger, positive relationships with their custodial parent (Seccombe and Warner, 2004). In a

study of college-age respondents, Arditti (1999) found that increasing closeness and a movement toward more democratic parenting styles were experienced. Others have also found that relationships between mothers and children become closer and stronger (Guttman, 1993) and suggest that greater equality and less rigid parenting is beneficial after divorce (Steward, Copeland, Chester, Malley, and Barenbaum, 1997).

3. **Greater emotional independence in sons**. Drexler (2005) notes that sons who are raised by mothers only develop an emotional sensitivity to others that is beneficial in relationships.
4. **Feeling more anxious in their own love relationships.** Children of divorce may feel more anxious about their own relationships as adults. This may reflect a fear of divorce if things go wrong, or it may be a result of setting higher expectations for their own relationships.
5. **Adjustment of the custodial parent**. Furstenberg and Cherlin (1991) believe that the primary factor influencing the way that children adjust to divorce is the way the custodial parent adjusts to the divorce. If that parent is adjusting well, the children will benefit. This may explain a good deal of the variation we find in children of divorce. Adults going through a divorce should consider good self-care as beneficial to the children-not as self-indulgent.

6. **Mental health issues**: Some studies suggest that anxiety and depression that are common in children and adults within the first year of divorce may actually not resolve. A 15-year study by Bohman, Låftman, Päären, Jonsson (2017) suggests that parental separation significantly increases the risk for depression 15 years later when depression rates were compared to matched controls. In fact, the risk of depression was related more strongly to parental conflict and parental separation than it was to parental depression.

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Changing Family Structure

According to the 2010 census data, only 66 percent of children under seventeen years old live in a household with two married parents. This is a decrease from 77 percent in 1980 (U.S. Census, 2011). This two-parent family structure is known as a **nuclear family,** referring to married parents and children as the nucleus, or core, of the group. Recent years have seen a rise in variations of the nuclear family with the parents not being married. Three percent of children live with two cohabiting parents (U.S. Census, 2011).

Some two-parent households consist of same-sex parents. Over 30% of same-sex couples are raising children, not far from the 43 percent of opposite-sex couples (U.S. Census, 2009). Of the children

in same-sex couple households, 73 percent are biological children (of only one of the parents), 21 percent are adopted only, and 6 percent are a combination of biological and adopted (U.S. Census, 2009). While there have been some questions regarding the well-being of children who grow up in same-sex households, research reports that same-sex parents are as effective as opposite-sex parents. In an analysis of 81 parenting studies, sociologists found no quantifiable data to support the notion that opposite-sex parenting is any better than same-sex parenting. Children of lesbian couples, however, were shown to have slightly lower rates of behavioral problems and higher rates of self-esteem (Biblarz & Stacey 2010).

Single-parent households are on the rise. In 2010, 27 percent of children lived with a single parent only, up from 25 percent in 2008. Of that 27 percent, 23 percent live with their mother, and three percent live with their father. Ten percent of children living with their single mother and 20 percent of children living with their single father also live with the cohabitating partner of their parent (for example, boyfriends or girlfriends).

Stepparents are an additional family element in two-parent homes. Among children living in two-parent households, 9 percent live with a biological or adoptive parent and a stepparent. The majority (70 percent) of those children live with their biological mother and stepfather. Family structure has been shown to vary with the age of the child. Older children (fifteen to seventeen years old) are less likely to live with two parents than adolescent children (six to fourteen years old) or young children (zero to five years old). Older children who do live with two parents are also more likely to live with stepparents (U.S. Census, 2011).

In some family structures, a parent is not present at all. In 2010, three million children (4 percent of all children) lived with a guardian who was neither their biological nor adoptive parent. Of these children, 54 percent live with grandparents, 21 percent live with other relatives, and 24 percent live with nonrelatives. This family structure is referred to as the **extended family** and may include aunts, uncles, and cousins living in the same home. Foster parents

account for about a quarter of nonrelatives. The practice of grandparents acting as parents, whether alone or in combination with the child's parent, is becoming widespread among today's families (De Toledo and Brown 1995). Nine percent of all children live with a grandparent, and in nearly half those cases, the grandparent maintains primary responsibility for the child (U.S. Census, 2011). A grandparent functioning as the primary care provider often results from parental drug abuse, incarceration, or abandonment. Events like these can render the parent incapable of caring for his or her child.

Changes in the traditional family structure raise questions about how such societal shifts affect children. U.S. Census statistics have long shown that children living in homes with both parents grow up with more financial and educational advantages than children who are raised in single-parent homes (U.S. Census, 1997). Parental marital status seems to be a significant indicator of advancement in a child's life. Children living with a divorced parent typically have more advantages than children living with a parent who never married; this is particularly true of children who live with divorced fathers. This finding correlates with the statistic that never-married parents are typically younger, have fewer years of schooling, and have lower incomes (U.S. Census, 1997). Six in ten children living with only their mother live near or below the poverty level. Of those being raised by single mothers, 69 percent live in or near poverty compared to 45 percent for divorced mothers (U.S. Census 1997). Though other factors such as age and education play a role in these differences, it can be inferred that marriage between parents is generally beneficial for children.

Sibling Relationships

Siblings spend a considerable amount of time with each other and offer a unique relationship that is not found with same-age peers

or with adults. Siblings play an important role in the development of social skills. Cooperative and pretend play interactions between younger and older siblings can teach empathy, sharing, and cooperation (Pike, Coldwell, & Dunn, 2005), as well as negotiation and conflict resolution (Abuhatoum & Howe, 2013). However, the quality of sibling relationships is often mediated by the quality of the parent-child relationship and the psychological adjustment of the child (Pike et al., 2005). For instance, more negative interactions between siblings have been reported in families where parents had poor patterns of communication with their children (Brody, Stoneman, & McCoy, 1994). Children who have emotional and behavioral problems are also more likely to have negative interactions with their siblings. However, the psychological adjustment of the child can sometimes be a reflection of the parent-child relationship. Thus, when examining the quality of sibling interactions, it is often difficult to tease out the separate effect of adjustment from the effect of the parent-child relationship.

While parents want positive interactions between their children, conflicts are going to arise, and some confrontations can be the impetus for growth in children's social and cognitive skills. The sources of conflict between siblings often depend on their respective ages. Dunn and Munn (1987) revealed that over half of all sibling conflicts in early childhood were disputes about property rights. By middle childhood, this starts shifting toward control over social situations, such as what games to play, disagreements about facts or opinions, or rude behavior (Howe, Rinaldi, Jennings, & Petrakos, 2002). Researchers have also found that the strategies children use to deal with conflict change with age, but that this is also tempered by the nature of the conflict. Abuhatoum and Howe (2013) found that coercive strategies (e.g., threats) were preferred when the dispute centered on property rights, while reasoning was more likely to be used by older siblings and in disputes regarding control over the social situation. However, younger siblings also use reasoning, frequently bringing up the concern of legitimacy (e.g., "You're not the boss") when in conflict with an older sibling.

This strategy is commonly used by younger siblings and is possibly an adaptive strategy in order for younger siblings to assert their autonomy (Abuhatoum & Howe, 2013). A number of researchers have found that children who can use non-coercive strategies are more likely to have a successful resolution, whereby a compromise is reached, and neither child feels slighted (Ram & Ross, 2008; Abuhatoum & Howe, 2013).

Not surprisingly, friendly relationships with siblings often lead to more positive interactions with peers. The reverse is also true. A child can also learn to get along with a sibling, with, as the song says, "a little help from my friends" (Kramer & Gottman, 1992).

In late adolescence, as teens become more independent, research has shown a decline in the frequency of interactions between siblings, as presumably peers and romantic relationships become more central to the lives of young people. Aquilino (2006) suggests that during this transition, the task may be to maintain enough of a sibling bond so that there will be a foundation for this relationship in later life. Those who are successful can often move away from the "older-younger" sibling conflicts of childhood, toward an equal relationship between two adults. Siblings that were close to each other in childhood are typically close in adulthood (Dunn, 1984, 2007), and in fact, it is unusual for siblings to develop closeness for the first time in adulthood. Overall, the majority of adult sibling relationships are close (Cicirelli, 2009).

Parent-Child Conflict

Despite popular belief, it appears that most teens do not experience adolescent "storm and stress" to the degree once famously suggested by G. Stanley Hall, a pioneer in the study of adolescent development. Only small numbers of teens have major conflicts with their parents (Steinberg & Morris, 2001), and most disagreements are minor. For example, in a study of over 1,800 parents of

adolescents from various cultural and ethnic groups, Barber (1994) found that conflicts occurred over day-to-day issues such as homework, money, curfews, clothing, chores, and friends. These disputes occur because an adolescent's drive for independence and autonomy conflicts with the parent's supervision and control. These types of arguments tend to decrease as teens develop (Galambos & Almeida, 1992).

As adolescents work to form their identities, they pull away from their parents, and the peer group becomes very important (Shanahan, McHale, Osgood, & Crouter, 2007). Despite spending less time with their parents, most teens report positive feelings toward them (Moore, Guzman, Hair, Lippman, & Garrett, 2004). Warm and healthy parent-child relationships have been associated with positive child outcomes, such as better grades and fewer school behavior problems, in the United States as well as in other countries (Hair et al., 2005).

Although peers take on greater importance during adolescence, family relationships remain important too. One of the key changes during adolescence involves a renegotiation of parent-child relationships. As adolescents strive for more independence and autonomy during this time, different aspects of parenting become more salient. For example, parents' distal supervision and monitoring become more important as adolescents spend more time away from parents and in the presence of peers. Parental monitoring encompasses a wide range of behaviors such as parents' attempts to set rules and know their adolescents' friends, activities, and whereabouts, in addition to adolescents' willingness to disclose information to their parents. (Stattin & Kerr, 2000). Psychological control, which involves manipulation and intrusion into adolescents' emotional and cognitive world through invalidating adolescents' feelings and pressuring them to think in particular ways is another aspect of parenting that becomes more salient during adolescence and is related to more problematic adolescent adjustment.

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Child Maltreatment

The Child Abuse Prevention and Treatment Act (United States Department of Health and Human Services, 2013) defines **child maltreatment** as any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent risk of serious harm (p. viii). **Child abuse** occurs when a parent or caretaker inflicts, or allows someone to inflict, serious physical injury other than by accidental means. **Child neglect** is the failure of a parent or caretaker to provide for a child's needs to the degree that the child's health, safety, and well-being are threatened with harm. Each state has its own definition of child abuse based on federal law, and most states recognize four major types of maltreatment: neglect, physical abuse, sexual abuse, and psychological maltreatment. Each of the forms of child maltreatment may be identified alone, but they can occur in combination.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=107#oembed-1

Video 1. *What are Child Abuse and Neglect* discusses the different types of abuse and interventions to prevent maltreatment.

Child Protective Services (CPS) agencies received an estimated 3.5 million referrals involving approximately 6.4 million children, and 2.1 million referrals (60%) were investigated. This is a rate of 28.3 per 1,000 children in the national population. Three-fifths of child abuse reports are made by professionals, including teachers, law enforcement personnel, and social services staff. The rest are made by anonymous sources, other relatives, parents, friends, and neighbors.

Child maltreatment may come in several forms, the most common being neglect (78.3%), followed by physical abuse (10.%), sexual abuse (7.6%), psychological maltreatment (7.6%), and medical neglect (2.4%) (Child Help, 2011). Some children suffer from a combination of these forms of abuse. The majority (81.2%) of perpetrators are parents; 6.2 percent are other relatives.

Nationally, an estimated 1,520 children die from abuse and neglect, and nearly three-quarters (73.9%) of all child fatalities were younger than three years old. Boys had a higher child fatality rate (2.36 per 100,000 boys) than girls (1.77 per 100,000 girls). More than 85 percent (86.8%) of child fatalities were comprised of White (39.3%), African-American (33.0%), and Hispanic (14.5%) victims, and 78.9% of child fatalities were caused by one or both parents (United States Department of Health and Human Services, 2013).

As most reports of abuse and neglect come from professionals working with children, they need to be aware of the potential signs of abuse and neglect. The following signs exhibited by children and their parents may signal the presence of child abuse or neglect.

The Child:

- Shows sudden changes in behavior or school performance
- Has not received help for physical or medical problems brought to the parents' attention
- Has learning problems (or difficulty concentrating) that cannot be attributed to specific physical or psychological causes

- Is always watchful, as though preparing for something bad to happen
- Lacks adult supervision What Is Child Abuse and Neglect?
- Is overly compliant, passive, or withdrawn
- Comes to school or other activities early, stays late, and does not want to go home
- Is reluctant to be around a particular person
- Discloses maltreatment

The Parent:

- Denies the existence of—or blames the child for—the child's problems in school or at home
- Asks teachers or other caregivers to use harsh physical discipline if the child misbehaves
- Sees the child as entirely bad, worthless, or burdensome
- Demands a level of physical or academic performance the child cannot achieve
- Looks primarily to the child for care, attention, and satisfaction of the parent's emotional needs
- Shows little concern for the child The Parent and Child:
- Rarely touch or look at each other
- Consider their relationship entirely negative
- States that they do not like each other

The above list may not be *all* the signs of abuse or neglect. It is essential to pay attention to other behaviors that may seem unusual or concerning. In addition to these signs and symptoms, Child Welfare Information Gateway provides information on the risk factors and perpetrators of child abuse and neglect fatalities

Neglect

Neglect is the failure of a parent, guardian, or other caregivers to provide for a child's basic needs. There are many forms of neglect: physical, medical, educational, emotional, and abandonment.

Physical is a failure to provide for the child's physical needs.

Parents must provide their children with food and water. They also need safe, appropriate shelter. Shelter may be more than just a roof of their head. Is the home structurally safe? Is there a means for keeping the house a safe temperature? Is there water for hygiene? Are there any health and safety issues with the home? Parents are also required to provide appropriate supervision for the child to keep them safe. Appropriate may be challenging to define. Many states do not provide strict rules as to when children may be unsupervised or for how long, or when children can be responsible for caring for younger siblings. That is due to variations in maturity. Some 10-year-olds can be trusted to stay home alone for short periods, and some 15-year-olds cannot be left unsupervised for any amount of time.

Medical neglect is the failure to provide necessary medical or mental health treatment that a child needs. If a child is injured or sick and requires medical intervention, it is the parents' responsibility to be sure that the child gets help. The same is true if the child were having a mental health crisis or needed psychological intervention for their health and safety. Finally, dental issues that cause the child pain or infection would also be a medical requirement. Medical neglect can be another challenge to define. For example, would never take a child to a doctor for a physical be neglect? What about the failure to get the child vaccinated? In many states, failure to provide preventative medical care would not be considered neglect.

Educational neglect is a failure to educate a child. All children have the right to free public education, but it is the parents' responsibility to make sure that the child gets to school—at least for the time in which school is compulsory. In most states, kindergarten is not mandatory. Similarly, after a certain age, teens are no longer required to attend school. Educational neglect would not apply in these situations. If a parent chooses not to send their child to a public school, it is then their responsibility to ensure that the child receives an appropriate education. This education could be through a private school or homeschooling. Each state has its own

regulations around what is considered acceptable for private or homeschooling education. Some states have strict rules that require regular submission of lessons, updates regarding student progress, and mandates for all children to take standardized exams. Other states require no more than a letter from the parent stating that the child will be homeschooled, no follow-up on the child's learning. Educational neglect may also be a failure for the parent to attend to special education needs, even if the child is in public school. Parents that do not comply with requests to get their child tested, meet for planning meetings, or sign off on educational plans may impede their child from receiving the special education services that they require.

Emotional neglect is the failure to meet a child's emotional needs. This behavior could range from being inattentive or emotionally unavailable to the child to being outright rejecting. Children need affection, love, support, and social interaction. For younger children, this primarily comes from their caregivers, but even older children need to feel the love from their parents.

Abandonment includes situations where the parent's identity or whereabouts are unknown, the child has been left alone in circumstances where the child suffers serious harm, or the parent has failed to maintain contact with the child or provide reasonable support for a specified period. If a parent cannot be present to care for their child, it is their responsibility to arrange for safe, appropriate care.

Consider the possibility of neglect when the child:

- Is frequently absent from school
- Begs or steals food or money Lacks needed medical or dental care, immunizations, or glasses
- Is consistently dirty and has severe body odor
- Lacks sufficient clothing for the weather
- Abuses alcohol or other drugs
- States that there is no one at home to provide care

Consider the possibility of neglect when the parent or other adult caregiver:

- Appears to be indifferent to the child
- Seems apathetic or depressed
- Behaves irrationally or in a bizarre manner
- Is abusing alcohol or other drugs

Many parents do not purposely neglect their children; factors such as cultural values, the standard of care in a community, and poverty can lead to a hazardous level of neglect. If information or assistance from public or private services are available, and a parent fails to use those services, child welfare services may intervene (U.S. Department of Health and Human Services).

Physical Abuse

Physical Abuse is nonaccidental physical injury (ranging from minor bruises to severe fractures or death) as a result of punching, beating, kicking, biting, shaking, throwing, stabbing, choking, hitting (with a hand, stick, strap, or other objects), burning, or otherwise harming a child, that is inflicted by a parent, caregiver, or other people who have responsibility for the child. Such injury is considered abuse regardless of whether the caregiver intended to hurt the child. Physical abuse in children may come in the form of beating, kicking, throwing, choking, hitting with objects, burning, or other methods. Physical discipline, such as spanking or paddling, is not considered abuse as long as it is reasonable and causes no bodily injury to the child (Child Welfare Information Gateway, 2008).

This issue is somewhat controversial among modern-day people in the United States. While some parents feel that physical discipline, or corporal punishment, is an effective way to respond to bad behavior, others feel that it is a form of abuse. According to

a poll conducted by ABC News, 65 percent of respondents approve of spanking, and 50 percent said that they sometimes spank their child.

Consider the possibility of physical abuse when the child:

- Has unexplained burns, bites, bruises, broken bones, or black eyes
- Has fading bruises or other marks noticeable after an absence from school
- Seems frightened of the parents and protests or cries when it is time to go home
- Shrinks at the approach of adults
- Reports injury by a parent or another adult caregiver
- Abuses animals or pets

Consider the possibility of physical abuse when the parent or other adult caregiver:

- Offers conflicting, unconvincing, or no explanation for the child's injury, or provides an explanation that is not consistent with the injury
- Describes the child as "evil" or in some other very negative way
- Uses harsh physical discipline with the child
- Has a history of abuse as a child
- Has a history of abusing animals or pets

The tendency toward physical punishment may be affected by culture and education. Those who live in the South are more likely than those who live in other regions of the United States to spank their child. Those who do not have a college education are also more likely to spank their child (Crandall, 2011). Studies have shown that spanking is not an effective form of punishment and may lead to aggression by the victim, particularly in those who are spanked at a young age (Berlin 2009).

Sexual Abuse

Sexual abuse includes activities by a parent or caregiver such as fondling a child's genitals, penetration, incest, rape, sodomy, indecent exposure, and exploitation through prostitution or the production of pornographic materials. Sexual abuse is defined as "the employment, use, persuasion, inducement, enticement, or coercion of any child to engage in, or assist any other person to engage in, any sexually explicit conduct or simulation of such conduct for the purpose of producing a visual depiction of such conduct; or the rape, and in cases of caretaker or inter-familial relationships, statutory rape, molestation, prostitution, or other forms of sexual exploitation of children, or incest with children" (Child Welfare Information Gateway, 2008).

Researchers estimate that 1 out of 4 girls and 1 out of 10 boys have been sexually abused (Valente, 2005). The median age for sexual abuse is 8 or 9 years for both boys and girls (Finkelhor et al. 1990). Most boys and girls are sexually abused by a male. Childhood sexual abuse is defined as any sexual contact between a child and an adult or a much older child. Incest refers to sexual contact between a child and family members. In each of these cases, the child is exploited by an older person without regard for the child's developmental immaturity and inability to understand the sexual behavior (Steele, 1986).

Although rates of sexual abuse are higher for girls than for boys, boys may be less likely to report abuse because of the cultural expectation that boys should be able to take care of themselves and because of the stigma attached to homosexual encounters (Finkelhor et al. 1990). Girls are more likely to be victims of incest, and boys are more likely to be abused by someone outside the family. Sexual abuse can create feelings of self-blame, betrayal, and feelings of shame and guilt (Valente, 2005). Sexual abuse is particularly damaging when the perpetrator is someone the child trusts. Victims of sexual abuse may suffer from depression, anxiety,

problems with intimacy, and suicide (Valente, 2005). Sexual abuse has additional impacts, as well. Studies suggest that children who have been sexually abused have an increased risk of eating disorders and sleep disturbances. Further, sexual abuse can lead to Post Traumatic Stress Disorder.

Consider the possibility of sexual abuse when the child:

- Has difficulty walking or sitting
- Suddenly refuses to change for gym or to participate in physical activities
- Reports nightmares or bedwetting
- Experiences a sudden change in appetite
- Demonstrates bizarre, sophisticated, or unusual sexual knowledge or behavior
- Becomes pregnant or contracts a venereal disease, particularly if under age 14
- Runs away • Reports sexual abuse by a parent or another adult caregiver
- Attaches very quickly to strangers or new adults in their environment

Consider the possibility of sexual abuse when the parent or other adult caregiver:

- Is unduly protective of the child or severely limits the child's contact with other children, especially of the opposite sex
- Is secretive and isolated
- Is jealous or controlling with family members

Being sexually abused as a child can have a powerful impact on self-concept. The concept of **false self-training** (Davis, 1999) refers to holding a child to adult standards while denying the child's developmental needs. Sexual abuse is just one example of false self-training. These abused children are held to adult standards of desirableness and sexuality while their level of cognitive,

psychological, and emotional immaturity are ignored. Consider how confusing it might be for a 9-year-old girl who has physically matured early to be thought of as a potential sex partner. Her cognitive, psychological, and emotional state does not equip her to make decisions about sexuality or, perhaps, to know that she can say no to sexual advances. She may feel like a 9-year-old in all ways and be embarrassed and ashamed of her physical development. Girls who mature early have problems with low self-esteem because of the failure of others (family members, teachers, ministers, peers, advertisers, and others) to recognize and respect their developmental needs. Overall, youth are more likely to be victimized because they do not have control over their contact with offenders (parents, babysitters, etc.) and have no means of escape (Finkelhor and Dzuiba-Leatherman, in Davis, 1999).

Psychological Maltreatment

Psychological maltreatment is a pattern of behavior that impairs a child's emotional development or sense of self-worth. This behavior may include constant criticism, threats, or rejection, as well as withholding love, support, or guidance. Emotional abuse is often difficult to prove, and therefore, child protective services may not be able to intervene without evidence of harm or mental injury to the child. Emotional abuse is almost always present when other types of maltreatment are identified.

Consider the possibility of emotional maltreatment when the child:

- Shows extremes in behavior, such as overly compliant or demanding behavior, extreme passivity, or aggression
- Is either inappropriately adult (parenting other children, for example) or inappropriately infantile (frequently rocking or head-banging, for example)

- Is delayed in physical or emotional development
- Has attempted suicide
- Reports a lack of attachment to the parent

Consider the possibility of emotional maltreatment when the parent or other adult caregiver:

- Constantly blames, belittles, or berates the child
- Is unconcerned about the child and refuses to consider offers of help for the child's problems
- Overtly rejects the child

Risk Factors for Maltreatment

Child abuse occurs at all socioeconomic and education levels and crosses ethnic and cultural lines. Just as child abuse is often associated with stresses felt by parents, including financial stress, parents who demonstrate resilience to these stresses are less likely to abuse (Samuels 2011). Young parents are typically less capable of coping with stresses, particularly the stress of becoming a new parent. Teenage mothers are more likely to abuse their children than their older counterparts. As a parent's age increases, the risk of abuse decreases. Children born to mothers who are fifteen years old or younger are twice as likely to be abused or neglected by age five than are children born to mothers ages twenty to twenty-one (George and Lee 1997).

Drug and alcohol use is also a known contributor to child abuse. Children raised by substance abusers have a risk of physical abuse three times greater than other kids, and neglect is four times as prevalent in these families (Child Welfare Information Gateway 2011). Other risk factors include social isolation, depression, low parental education, and a history of being mistreated as a child.

Approximately 30 percent of abused children will later abuse their own children (Child Welfare Information Gateway 2006).

Outcomes Associated with Maltreatment

Child abuse and neglect can have lifelong implications for victims, including the impact the physical, mental, and emotional wellbeing. While the physical wounds heal, there are several long-term consequences of experiencing the trauma of abuse or neglect. Children who are maltreated are at risk of experiencing cognitive delays and emotional difficulties, among other issues. Childhood trauma also negatively affects nervous system and immune system development, putting children who have been maltreated at a higher risk for health problems as adults

Injury, poor health, and mental instability occur at a high rate in this group, with 80 percent meeting the criteria of one or more psychiatric disorders, such as depression, anxiety, or suicidal behavior, by age twenty-one. Abused children may also suffer from cognitive and social difficulties. Behavioral consequences will affect most, but not all, of child abuse victims. Children of abuse are 25 percent more likely, as adolescents, to suffer from difficulties like poor academic performance and teen pregnancy, or to engage in behaviors like drug abuse and general delinquency. They are also more likely to participate in risky sexual acts that increase their chances of contracting a sexually transmitted disease (Child Welfare Information Gateway 2006). Other risky behaviors include drug and alcohol abuse. As these consequences can affect healthcare, education, and criminal systems, the problems resulting from child abuse do not just belong to the child and family, but to society as a whole.

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Stress and Development

What is the impact of stress on development? The answer to that question is complex and depends on several factors, including the number of stressors, the duration of stress, and the individual's ability to cope with stress.

Children experience different types of stressors that could be manifest in various ways. Everyday stress can provide an opportunity for individuals to build coping skills and poses little risk to development. Even long-lasting stressful events, such as changing schools or losing a loved one, can be managed reasonably well.

Some experts have theorized that there is a point where prolonged or excessive stress becomes harmful and can lead to serious health effects. When stress builds up in childhood, neurobiological factors are affected; in turn, levels of the stress hormone cortisol exceed normal ranges. Due in part to the biological consequences of excessive cortisol, children can develop physical, emotional, and social symptoms. Physical conditions include cardiovascular problems, skin conditions, susceptibility to viruses, headaches, or stomach aches in young children. Emotionally, children may become anxious or depressed, violent, or feel overwhelmed. Socially, they may become withdrawn and act out towards others, or develop new behavioral ticks such as biting nails or picking at skin.

Types of Stress

Researchers have proposed three distinct types of responses to stress in young children: positive, tolerable, and toxic. Positive stress (also called eustress) is necessary and promotes resilience, or the ability to function competently under threat. Such stress arises from brief, mild to moderate stressful experiences, buffered by the presence of a caring adult who can help the child cope with the stressor. This type of stress causes minor, temporary physiological and hormonal changes in the young child, such as an increase in heart rate and a change in hormone cortisol levels. The first day of school, a family wedding, or making new friends are all examples of positive stressors. Tolerable stress comes from adverse experiences that are more intense but short-lived and can usually be overcome. Some examples of tolerable stressors are family disruptions, accidents, or the death of a loved one. The body's stress response is more intensely activated due to severe stressors; however, the response is still adaptive and temporary.

Toxic stress is a term coined by pediatrician Jack P. Shonkoff of the Center on the Developing Child at Harvard University to refer to chronic, excessive stress that exceeds a child's ability to cope, especially in the absence of supportive caregiving from adults. Extreme, long-lasting stress in the absence of supportive relationships to buffer the effects of a heightened stress response can produce damage and weakening of bodily and brain systems, which can lead to diminished physical and mental health

throughout a person's lifetime. Exposure to such toxic stress can result in the stress response system becoming more highly sensitized to stressful events, producing increased wear and tear on physical systems through over-activation of the body's stress response. This wear and tear increases the later risk of various physical and mental illnesses.

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Video 1. *Toxic Stress DerailsHealthy Development* explains some of the biological changes that accompany toxic stress.

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Adverse Childhood Experiences

The toxic stress that children endure can have a significant impact on their later lives. According to Merrick, Ford, Ports, and Guinn (2018), the foundation for lifelong health and well-being is created in childhood, as positive experiences strengthen biological systems

while adverse experiences can increase mortality and morbidity **Adverse Childhood Experiences**, or ACEs, are potentially traumatic events that occur in childhood (0-17 years) such as experiencing violence, abuse, or neglect; witnessing violence in the home; and having a family member attempt or die by suicide. Also included are aspects of the child's environment that can undermine their sense of safety, stability, and bonding such as growing up in a household with substance misuse, mental health problems, or instability due to parental separation or incarceration of a parent, sibling, or another member of the household. Traumatic events in childhood can be emotionally painful or distressing and can have effects that persist for years.2 Factors such as the nature, frequency, and seriousness of the traumatic event, prior history of trauma, and available family and community supports can shape a child's response to trauma.

Some groups have been found to be at a greater risk for experiencing ACEs. Merrick et al. (2018) reviewed the results from the 2011-2014 Behavioral Risk Factor Surveillance System, which included an ACE module consisting of questions adapted from the Centers for Disease Control and Prevention. Each question was collapsed into one of the eight ACE categories: physical abuse, emotional abuse, sexual abuse, household mental illness, household substance use, household domestic violence, incarcerated household member, and parental separation or divorce. The results indicated that 25% of the sample had been exposed to three or more ACEs, and although ACEs were found across all demographic groups, those who identified as Black, multiracial, lesbian/gay/bisexual, having less than a high school education, being low income, and unemployed experienced significantly higher ACE exposure. Assisting families and providing children with supportive and responsive adults can help prevent the negative effects of ACEs.

Consequences of ACEs and Toxic Stress

An estimated 62% of adults surveyed across 23 states reported that they had experienced one ACE during childhood and nearly one-quarter reported that they had experienced three or more ACEs. ACEs can have negative, lasting effects on health, wellbeing, and opportunity. These exposures can disrupt healthy brain development, affect social development, compromise immune systems, and can lead to substance misuse and other unhealthy coping behaviors. The evidence confirms that these exposures increase the risks of injury, sexually transmitted infections, including HIV, mental health problems, maternal and child health problems, teen pregnancy, involvement in sex trafficking, a wide range of chronic diseases and the leading causes of death such as cancer, diabetes, heart disease, and suicide. ACEs can also negatively impact education, employment, and earnings potential. The total economic and social costs to families, communities, and society is in the hundreds of billions of dollars each year.

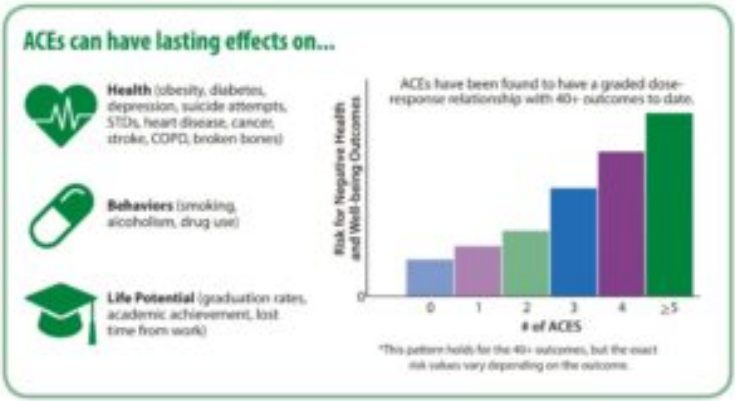

Figure 1. Risk of outcomes due to adverse childhood experiences. Children who experience toxic stress or who live in extremely

stressful situations of abuse over long periods can suffer long-lasting effects. The structures in the midbrain or limbic systems, such as the hippocampus and amygdala, can be vulnerable to prolonged stress (Middlebrooks and Audage, 2008). High levels of the stress hormone cortisol can reduce the size of the hippocampus and affect a child's memory abilities. Stress hormones can also reduce immunity to disease. If the brain is exposed to long periods of severe stress, it can develop a low threshold, making a child hypersensitive to stress in the future.

With chronic toxic stress, children undergo long-term hyper-arousal of brain stem activity. This activity includes an increase in heart rate, blood pressure, and arousal states. These children may experience a change in brain chemistry, which leads to hyperactivity and anxiety. Therefore, it is evident that chronic stress in a young child's life can create significant physical, emotional, psychological, social, and behavioral changes; however, the effects of stress can be minimized if the child has the support of caring adults.

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Video 2. *How Childhood Trauma Affects Health Across a Lifetime* discusses the development of an ACE assessment and the research results on outcomes.

separating Families At the U.S. Border

Thousands of children were separated from their parents beginning in April 2018 as they approached the United States border by Immigration and Customs Enforcement (ICE). Children were placed in separate facilities from their parents when they were being processed, and they were not told when they would be reunited. When enduring stressful situations, separation from one's parents can be extremely detrimental to a child (Society for Research in Child Development (SRCD), 2018). Parental separations affect children's stress management systems by changing how the body responds to stress. Long-term stress can disrupt brain functioning, cognitive skills, emotional processing, and physiological health. When exposed to stress, children typically look to their parents for support and care, and parents can reduce children's stress. These separated children were already under extreme stress escaping their previous homes and then were separated from the individuals who could support them through this process. Stress from parent separation places children at a higher risk for anxiety, depression, PTSD, lower IQ, obesity, impaired immune system functioning, and medical conditions (SRCD, 2018). Even after being reunited, children can experience attachment issues, poorer self-esteem, and physical and psychological health difficulties. As they age, they continue to exhibit an increased risk for mental health problems, problems in social interactions, difficulty with adult attachments, poorer stress management, and an increased risk for death. The American Psychological

Association (2019) opposes policies that separate families given the negative outcomes suffered by children.

Preventing ACEs

The Centers for Disease Control and Prevention (2019) suggests several strategies that can prevent ACEs from happening in the first place as well as strategies to mitigate the harms of ACEs. The evidence tells us that ACEs can be prevented by strengthening economic supports for families, promoting social norms that protect against violence and adversity, ensuring a strong start for children and paving the way for them to reach their full potential, teaching skills to help parents and youth handle stress, manage emotions, and tackle everyday challenges. connecting youth to caring adults and activities, and intervening to lessen immediate and long-term harm.

Preventing ACEs	
Strategy	**Approach**
Strengthen economic supports to families	• Strengthening household financial security • Family-friendly work policies
Promote social norms that protect against violence and adversity	• Public education campaigns • Legislative approaches to reduce corporal punishment • Bystander approaches • Men and boys as allies in prevention
Ensure a strong start for children	• Early childhood home visitation • High-quality child care • Preschool enrichment with family engagement
Teach skills	• Social-emotional learning • Safe dating and healthy relationship skill programs • Parenting skills and family relationship approaches
Connect youth to caring adults and activities	• Mentoring programs • After-school programs
Intervene to lessen immediate and long-term harms	• Enhanced primary care • Victim-centered services • Treatment to lessen the harms of ACEs • Treatment to prevent problem behavior and future involvement in violence • Family-centered treatment for substance use disorders

Figure 2. Strategies for preventing adverse childhood experiences.

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Video 3. Preventing ACEs discusses how communities can reduce the risk for adverse childhood experiences.

Coping with Stress

Stress is encountered in four different stages. In the first stage, stress usually causes alarm. Next, in the second or appraisal stage, the person attempts to find meaning from the event. Stage three consists of the individual seeking out coping strategies. Lastly, in stage four, people execute one or more of the coping strategies. However, individuals with a lower tolerance for stressors are more susceptible to alarm and find a broader array of events to be stressful. These children often experience chronic or toxic stress.

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Video 4. *The Science of Resilience* describes a variety of factors involved in the development of resilience.

Some recommendations to help children manage stressful situations include:

- Preparing children for everyday stressful situations, such as traveling to new places or going to the doctor. For example, talk to children about the experience to help them understand that it is okay to be stressed and scared.
- Keeping communication open. This includes making sure that the child feels comfortable talking to a person. This may include being in a comfortable space, such as their bedroom, where they feel safe. The comfort level of the child is important because if a child is not comfortable, or feels forced to speak, they may not open up at all.

- Spending time together as a family so that no one's feelings go unseen, ensuring that a child knows that their feelings are valued, and should be expressed in healthy ways.
- Modeling healthy and successful coping mechanisms (such as going for a walk).
- Encouraging children to express themselves creatively (as an outlet or to help others to understand what is stressing the child). Some healthy outlets of stress relief include sports or running, writing, reading, art, as well as playing musical instruments.
- Teaching children to act and think positively when they are faced with a situation to manage the stress before it becomes overwhelming.
- Providing a safe and healthy home and environment for children.
- Providing children with proper nutrition and attention.
- Ensuring children are not exposed to substance abuse or violence. When a healthy environment is provided, children are more likely to be emotionally and physically healthy

Watch It

Video 5. *Trauma-Informed Practices to Support Learning* explains how one school placed a strong focus on relationships, social and emotional learning, and understanding students' mental health informs how Fall-Hamilton's staff interacts with students.

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Peer Relationships

Relationships within the family (parent-child and siblings) are not the only significant relationships in a child's life. Peer relationships are also important. Social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011). In peer relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. For example, as preschoolers engage in pretend play they create narratives together, choose roles, and collaborate to act out their stories. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an essential source of affirmation and self-esteem. At the same time, peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior). With increasing age, children confront the challenges of bullying, peer victimization, and managing conformity pressures. Social comparison with peers is an important means by which children evaluate their skills, knowledge, and personal qualities, but it may cause them to feel that they do not measure up well against others. For example, a boy who is not athletic may feel unworthy of his football-playing peers and revert to shy behavior, isolating himself, and avoiding conversation. Conversely, an athlete who does not "get" Shakespeare may feel embarrassed and avoid reading altogether. Also, with the approach of adolescence, peer relationships become focused on psychological intimacy, involving

personal disclosure, vulnerability, and loyalty (or its betrayal)—which significantly influences a child's outlook on the world. Each of these aspects of peer relationships requires developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept.

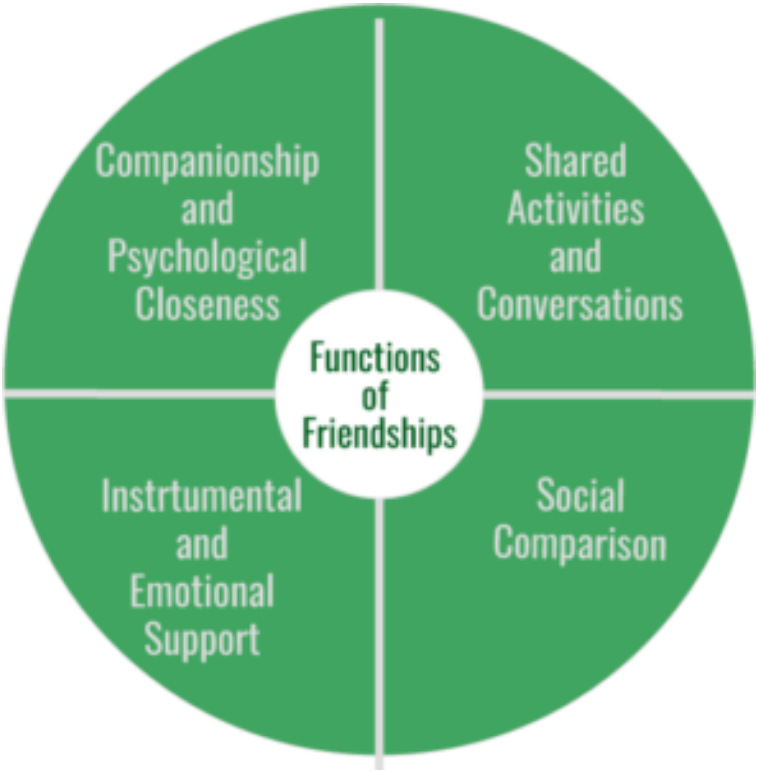

Figure 1. Functions of friendship. By Florida State College at Jacksonville, licensed under CC-BY 4.0 .

As children become adolescents, they usually begin spending more time with their peers and less time with their families, and

these peer interactions are increasingly unsupervised by adults. Children's notions of friendship often focus on shared activities, whereas adolescents' notions of friendship increasingly focus on intimate exchanges of thoughts and feelings.

During adolescence, peer groups evolve from primarily single-sex to mixed-sex. Adolescents within a peer group tend to be similar to one another in behavior and attitudes, which has been explained as being a function of **homophily** (adolescents who are similar to one another choose to spend time together in a "birds of a feather flock together" way) and influence (adolescents who spend time together shape each other's behavior and attitudes).

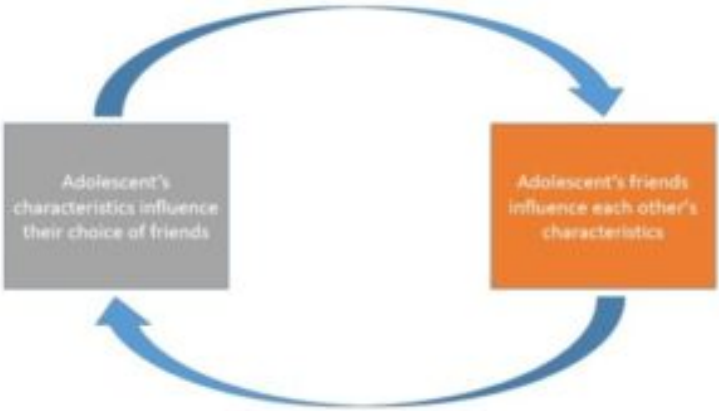

Figure 2. Reciprocal influences on friend selection and personal characteristics.

Peer pressure is usually depicted as peers pushing a teenager to do something that adults disapprove of, such as breaking laws or using drugs. One of the most widely studied aspects of adolescent peer influence is known as **deviant peer contagion** (Dishion & Tipsord, 2011). This influence is the process by which peers reinforce problem behavior by laughing or showing other signs of approval that then increase the likelihood of future problem behavior. Although deviant peer contagion is more extreme, regular

peer pressure is not always harmful. Peers can serve both positive and negative functions during adolescence. Negative peer pressure can lead adolescents to make riskier decisions or engage in more problematic behavior than they would alone or in the presence of their family. For example, adolescents are much more likely to drink alcohol, use drugs, and commit crimes when they are with their friends than when they are alone or with their families. However, peers also serve as an essential source of social support and companionship during adolescence, and adolescents with positive peer relationships are happier and better adjusted than those who are socially isolated or who have conflictual peer relationships.

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Crowds are an emerging level of peer relationships in adolescence. In contrast to friendships (which are reciprocal dyadic relationships) and **cliques** (which refer to groups of individuals who interact frequently), crowds are characterized more by shared reputations or images than actual interactions (Brown & Larson, 2009)These crowds reflect different prototypic identities (such as jocks or brains) and are often linked with adolescents' social status and peers' perceptions of their values or behaviors. Eventually, these crowds and cliques become less critical to teens as they place more value on close friendships and romantic relationships.

Crowds

Crowds are large groups of adolescents socially connected by a shared image and reputation (Brown, 2004), especially within the setting of a single school. A single person can belong to more than one crowd if their image matches the crowds' criteria (Brown, 2004; Mory, 1994). Because membership in a crowd depends on peers' perceptions, crowds in any given peer group will correspond to the local preconceived "types" of adolescents. Specific stereotypes vary from place to place, but many remain consistent. They are based on peer status, socioeconomic status, residential area, activities, social characteristics, or a combination of attributes (jocks, nerds, populars, and druggies are among the most commonly observed) (Brown, 2004; Mory, 1994; Arnett, 2002). Crowds are very different from cliques: while cliques are relatively small, close-knit groups based on frequent interaction and collectively determined membership, members of a crowd may not even know each other. Crowd membership reflects external assessments and expectations, providing a social context for identity exploration and self-definition as adolescents internalize or reject their crowd identities.

Because crowd membership is initially outwardly imposed, an adolescent's peers can classify them as belonging to a crowd that they do not consider themselves a member. Members of some crowds are more aware of and comfortable with their crowd designation than others; members of stigmatized or low-status groups, in particular, may resist or deny their undesirable categorization (Brown et al., 1992). Usually, however, adolescents embrace their crowd affiliation, using it to define themselves and advertise where they fit in their peer group's social structure (Newman & Newman, 2001; Brown et al., 1990).

Crowds and Identity Development

Crowds serve an essential purpose in adolescent identity development, shaping individual values, behavior, and personal and peer expectations. "[One's group] is often tantamount to one's own provisional identity" (Brown et al., 1994); the individual defines themself by the crowd to which they see themself belonging. Different crowds expose the individual to different norms. These norms encourage adolescents to interact with some people while avoiding others and reward certain behaviors while discouraging others, a process of normative social influence (Brown et al., 1990; Brown et al., 1994; Brown et al., 1995; Brown & Larson, 2009). For example, a member of a "preppy" crowd might be rewarded for dressing in a fashion for which a member of an "emo" crowd would be teased, and vice versa.

Crowd effects on norms of interaction:

- Norms affect how the individual interacts with others. Members of high-status (preppie, popular) groups often interact with many people, but most of these relationships are superficial and instrumental; interpersonal connections are used to establish and maintain social status (Eder, 1985; Lesko, 1988). By contrast, members of lower-caste groups (e.g., dorks, druggies) generally have fewer friends, mostly from within the crowd; however, these relationships are typically marked by greater loyalty, stability, and honesty (Lesko, 1988).
- Norms affect with whom the individual interacts. Crowds steer the individual toward certain people, attitudes, and behaviors. There are also effects of peer perception and expectations when individuals attempt to interact across crowds. In essence, one may be interested in a cross-crowd friendship, but whether or not the target reciprocates depends on their crowd's norms as well. The adolescent's social options for friendship and romance are limited by their crowd and by

other crowds (Brown et al., 1994).

Often crowds reinforce the behaviors that initially caused an individual to be labeled part of that crowd, which can positively or negatively influence the individual (toward academic achievement or drug use, for example). These pressures are often linked to the stereotypes members of crowds hold about themselves and members of other crowds: unity by the denigration of the outgroup (Brown et al., 1994).

Racial Crowds and Sub-Crowds

Adolescents' perception of crowd differences may depend on how closely related the adolescent observer is to a particular crowd. The primary, recurring crowd divisions (jocks, geeks, partiers) have been most often studied in predominantly white high schools, but they also exist for minority students. In multiracial schools, students seem to divide along ethnic lines first, then into these archetypical crowds within their ethnicity. However, one ethnic group may not notice the further divisions in other ethnic groups after the first, race-based split (Brown & Mounts, 1989). For instance, black students see themselves as divided into jocks, geeks, emos, stoners, popular kids, and so on, but white students may see them as just one crowd defined solely by ethnicity, "the black kids." Sometimes crowd membership transcends race, however, and adolescents are classified as "jocks" or "geeks" regardless of race (Horvat & Lewis, 2003; Tyson et al., 2005). This classification seems to vary and depends heavily on the context of the individual school.

Stereotypes, Stigma, and Cross-Crowd Friendships

While crowds are structured around prototypical caricatures of their members, real adolescents rarely match these extremes. Furthermore, not all adolescents agree on the characteristics typical of a stereotype (Brown et al., 1994). In other words, a regular manifestation of just a few central characteristics of a crowd is a sufficient basis for classification as a member of that crowd. Thus, not all "jocks" neglect their schoolwork, though that is part of the typical jock stereotype, and a person interested in fashion could still be considered a "geek."

Often a crowd is stigmatized by one or more other crowds. This stigmatization can affect adolescents' willingness to associate with members of that crowd, or even other crowds similar to it. For example, people may avoid being seen as a "brain," a middle-status crowd, because of the similarity between brains and "nerds," a lower-status crowd (Brown et al., 1990).

Shared interests form the basis of many friendships, so often adolescents are drawn to members of their own crowds, especially if their crowd is defined by activities rather than more superficial characteristics such as race or socioeconomic status. However, interests can be shared across crowd divisions. Accordingly, while an adolescent's closest friends are almost always part of the same clique (i.e., they interact frequently within the same small friend group), they are not always part of the same crowd, especially if multiple crowds have similar lifestyles (Brown et al., 1994).

Crowd-Hopping

Further emphasizing the flexible nature of crowd membership, some adolescents are not stably linked to one specific crowd—some

individuals are associated with multiple crowds, while others are not stably linked to any crowds and "float" among several. These appear more closely attached to individuals outside the peer group (family, dropout friends, friends from a non-school organization, etc.). Others may consciously work to change crowd affiliations to express different interests or achieve a change in social status. The crowd with which an adolescent desires to be identified is far less stable than the personal attributes by which the adolescent is likely to be categorized by peers. Accordingly, adolescents who change crowd membership (a process known as "crowd-hopping") tend to have lower self-esteem, perhaps because they have not yet found an environment and peer group that supports them. They likely continue changing crowd membership until they find a fulfilling niche (Brown et al., 1992).

The Rise of Crowds

Crowds first emerge in middle or junior high school, when children transition from stable, self-contained classroom peer groups into larger schools, where they interact with a more diverse body of peers with less adult guidance. Crowds emerge to group students by caricature and structure interactions between students of each type (Brown et al., 1994). Early crowds are often based on social status, especially among girls, with a small group of well-known children being "popular" and the rest "unpopular." To maintain their status, popular girls will avoid the overtures of less-popular children, which actually makes them disliked (Eder, 1985). Many children stop attempting to gain entry into the popular crowd and make friends with other children instead, giving rise to new crowds (Brown et al., 1994).

The stereotypes on which crowd definitions are based change over time as adolescents shift from grouping people by abstract characteristics rather than activities ("geeks" rather than "the kids

who read a lot"). With age, adolescents become more conscious of crowd divisions and the social hierarchy (Brown, 2004). Distinctions between crowds also become more nuanced, developing from simple popular/unpopular dichotomies to less hierarchical structures in which there are more than two levels of social acceptability, often with several crowds at each level (Kinney, 1993; Horn, 2003). As seen in cross-crowd friendships, some crowds interact with each other more readily than others. This transition to a more fluid social structure allows adolescents to change their status over time by changing crowds, remaining in a crowd that undergoes a change in status, or gaining the confidence and perspective to reject the assumptions of the social hierarchy (Brown et al., 1994; Kinney, 1993). Willingness to do so reflects a growing sense of personal identity distinct from crowd membership.

The Decline of Crowds

Adolescents' attitudes toward crowds change over time—while ninth-graders are willing to discriminate against members of other crowds, twelfth-graders are less likely to do so (Horn, 2003). Adolescents also develop more multifaceted self-concepts and reject crowd labels as simplistic attempts to describe an entire personality (Brown et al., 1994). Across the high school years, crowd significance as a basis for affiliation wanes (Horn, 2003), as does the influence of crowds on an individual's behavior (Brown, 2004). In fact, some studies indicate the importance of crowds peaks at age 12 or 13 (Brown et al., 1986). By the end of high school, adolescents often feel constrained by impersonal, crowd-derived identities (Larkin, 1979). This constraint, combined with the splintering off of romantic couples from the rest of the crowd, may account for the decline of crowd significance over time(Kuttler & La Greca, 2004).

Cliques

A **clique** is a group of individuals who interact with one another and share similar interests. Interacting with cliques is part of normative social development regardless of gender, ethnicity, or popularity. Although cliques are most commonly studied during adolescence and middle childhood development, they exist in all age groups. They are often bound together by shared social characteristics such as ethnicity and socioeconomic status (Labrum, 2016).

Typically, people in a clique will not have a completely open friend group and can, therefore, "ban" members if they do something considered unacceptable, such as talking to someone disliked. Some cliques tend to isolate themselves as a group and view themselves as superior to others, which can be demonstrated through bullying and other antisocial behaviors.

One person may be part of multiple cliques, each forming and functioning independently from one another. Cliques are relevant in society due to the social influence or peer pressure that results from the interactions with individuals who share a common characteristic. The outcomes associated with clique formations may be endless, with varying degrees of influence (Miller, 1958). So, a formal clique, such as a professional organization, would have a different kind of influence as compared to a social clique consisting of close friends.

A clique can also involve a high degree of social commitment to a specific group. A stronger level of commitment results in an individual having a reduced amount of interaction with other social groups. Cliquish behavior often involves repetition with regard to activities, vernacular, preferences, and manner, which can result in

conflict with other cliques, creating "outsiders." Individuals can also experience social isolation within their clique if their values and/or behavior begin to differ from the rest of the group.

Every clique has some form of organization that makes up the network of social interaction (Peay, 1974). Informal clique networks are groups that do not have a legitimate organizational structure in which they can be established and dissolved in a shorter period. An informal clique may consist of a person's friend group or co-workers, while it may also identify other, more informal groups, such as criminal gangs (Krackhardt, 1988). On the other hand, a formal clique is a group with a socially accepted organization that is hierarchical in structure. A formal clique is composed of members who have identifiable roles and interactions with one another and is found in the structure of numerous professional organizations, businesses, and even family structure. Culture is a very influential factor in the organization of clique structures because the boundaries established through differences in cultural aspects are persistent, even when the membership varies from time to time. For example, the differences in language, beliefs, traditions, etc. have always created a distinct separation or boundary between groups of people even though the members of that particular group are continually changing (Barth, 1998).

Development of Cliques

The formation and deformation of clique structures do not end with adolescence, even though the number of interactions with clique groups decreases, and the type of groups may change. As individuals become adults, their social interpretations alter, and the formation of their cliques originates from their immediate environment, rather than from common social characteristics (Carstensen, 2016). A clique should not be confused with a crowd because the smaller size and specific boundaries of a group

are what causes the group formation to be considered a clique. A clique can develop in several different ways and within environments that consist of individuals who interact regularly. The structural cohesion of the clique is the constant face-to-face interaction between members that can either create or dissolve the group, depending upon the level of interaction. If face-to-face interaction is regularly established, then cohesion between individuals will form. However, if the face-to-face interaction depreciates, then the cohesive social bond between said individuals will eventually dissolve (Friedkin, 1984).

Social impact of Cliques

A clique may inhibit external social influence by impacting the emotions, opinions, or behaviors of group members (Hochschild, 1979). There are many ways in which the perception of information between members in a clique can influence other members on a greater level than if they had received the same information from a different source. For example, receiving information from a close friend or family member is interpreted and responded to differently compared to receiving the same information from someone who is not within the clique structure. The satisfaction, interaction, and closeness between the clique groups that we involve ourselves in develops and changes throughout the years. Nevertheless, there is always a constant morphing of both the individual and the group as time goes on.

Homosociality to Hetersociality

Homosociality is the relationship between people of the same-sex, not romantic in nature. In children and young adolescence, more

friendships are with peers of the same sex. As adolescents mature, they become open to **heterosociality**, having relationships with people of the opposite sex, and **bisociality**, having relationships with same- and opposite-sex peers.

This process tends to occur in stages, as children transition from almost exclusive homosociality to heterosociality and eventually to romantic relationships. In stage one of this progression, cliques are same-sex and segregated from the opposite sex. In the second stage, opposite-sex cliques with similar interests start to associate. During the third stage, sex-segregated cliques break down, often with clique leaders pairing off into close friendships and romantic relationships. The fourth stage is when other clique members also leave the homosocial clique for hetero- and bisocial or romantic relationships. By stage five, cliques are less important to teens, and close or romantic relationships are the priority.

Cliques, Crowds, and Conformity

Video 1. *Adolescence, Cliques, Crowds, Conformity* discusses the different peer groups and the influence on youth culture.

One or more interactive elements has been excluded from this version of the text. You can view them online here:
https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=109#oembed-1

Romantic Relationships

Adolescence is the developmental period during which romantic relationships typically first emerge. Initially, same-sex peer groups that were common during childhood expand into mixed-sex peer groups that are more characteristic of adolescence. Romantic relationships often form in the context of these mixed-sex peer groups (Connolly, Furman, & Konarski, 2000).

Although romantic relationships during adolescence are often short-lived rather than long-term committed partnerships, their importance should not be minimized. Adolescents spend a great deal of time focused on romantic relationships, and their positive and negative emotions are more tied to romantic relationships (or lack thereof) than to friendships, family relationships, or school (Furman & Shaffer, 2003). Romantic relationships contribute to adolescents' identity formation, changes in family and peer relationships, and adolescents' emotional and behavioral adjustment.

Furthermore, romantic relationships are centrally connected to adolescents' emerging sexuality. Parents, policymakers, and researchers have devoted a great deal of attention to adolescents' sexuality, in large part because of concerns related to sexual intercourse, contraception, and preventing teen pregnancies. However, sexuality involves more than this narrow focus. Romantic relationships are a domain in which adolescents experiment with new behaviors and identities.

Sociometric Status

A child's status among their peers will influence their membership in peer groups and their ability to make friends. **Sociometric status** is a measurement that reflects the degree to which someone

is liked or disliked by their peers as a group. In developmental psychology, this system has been used to examine children's status in peer groups, its stability over time, the characteristics that determine it, and the long-term implications of one's popularity or rejection by peers.

The most commonly used sociometric system, developed by Coie & Dodge (1988), asks children to rate how much they like or dislike each of their classmates and uses these responses to classify them into five groups.

		Number of "least liked" nominations		
		Many		Few
Number of "most liked" nominations	Many	Controversial		Popular
			Average	
	Few	Rejected		Neglected

Figure 3. Sociometric peer statuses.

Popular children are those liked by many of their peers and disliked by few. These individuals are skilled at social interactions and maintain positive peer relationships. They tend to be cooperative, friendly, sociable, and sensitive to others. They are capable of being assertive without being aggressive, thus can get what they want without harming others. Among this group, there may be distinct levels of popularity:

- **Accepted** kids are the most common sub-group among the popular. While they are generally well-liked, they are not as magnetic as the very popular kids.
- **Very popular** kids are highly charismatic and draw peers to them.

Rejected children are designated as rejected if they receive many

negative nominations and few positive nominations. These individuals often have poor academic performance and more behavior problems in school. They are also at higher risk for delinquent behaviors and legal problems. These kids are more likely to be diagnosed with ADHD, conduct disorder, and substance abuse. They tend to be isolated, lonely and are at risk for depression. Rejected youth can be categorized into two types:

- **Aggressive-rejected** kids display hostile and threatening behavior, are physically aggressive, and disruptive. They may bully others, withhold friendship, ignore and exclude others. While they are lacking, they tend to overestimate their social competence.
- **Withdrawn-rejected** kids are socially withdrawn, wary, timid, anxious in social situations, and lack confidence. They are at risk of being bullied.

Individuals that are liked by many peers, but also dislike by many are designated as **controversial**. This group may possess characteristics of both the popular and the rejected group. These individuals tend to be aggressive, disruptive, and prone to anger. However, they may also be cooperative and social. They are often socially active and a good group leader. Their peers often view them as arrogant and snobbish.

The **neglected** children are designated as neglected if they receive few positive or negative nominations. These children are not especially liked or disliked by peers and tend to go unnoticed. As a result, they may be isolated and especially avoid confrontation or aggressive interactions. This group does tend to do well academically.

Finally, the **average** kids are designated as such because they receive an average number of both positive and negative nominations. They are liked by a small group of peers, but not disliked by very many.

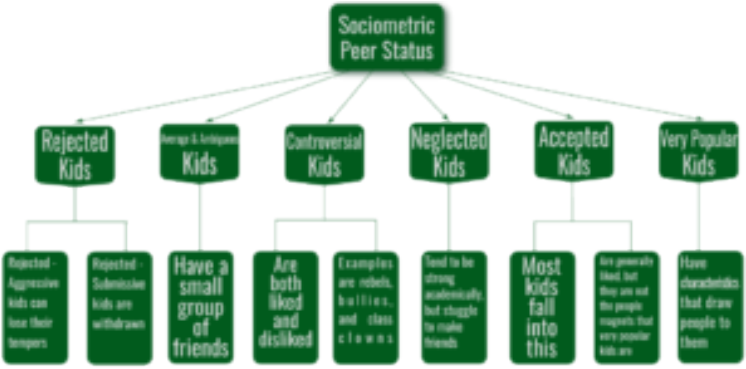

Figure 4. Sociometric peer statuses and characteristics.

Popularity

What makes a child popular? Several physical, cognitive, and behavioral factors impact popularity. First, adolescents that are perceived to be physically attractive tend to be more popular among their peers. Cognitive traits matter too. Individuals that demonstrate higher intelligence and do well academically tend to be more liked. Also, those that can take another's perspective and demonstrate social problem-solving skills are favored. Kids that can manage their emotions and behave appropriately gain higher status. Finally, kids like peers that are confident without being conceited.

Interventions

What can be done to help those that are not well-liked? For neglected kids, social skills training and encouraging them to join activities can help them become noticed by their peers and make

friends. For rejected kids, they may need support to help with anger management, to overcome anxiety, and cope with depression. This group can also benefit from social skills training to learn social competence and gain confidence.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=109#oembed-4

Bullying

Bullying is unwanted, aggressive behavior among school-aged children that involves a real or perceived power imbalance. The behavior is repeated, or has the potential to be repeated, over time. Both kids who are bullied and who bully others may have serious, lasting problems.

In order to be considered bullying, the behavior must be aggressive and include:

- An Imbalance of Power: Kids who bully use their power—such as physical strength, access to embarrassing information, or popularity—to control or harm others. Power imbalances can change over time and in different situations, even if they involve the same people.
- Repetition: Bullying behaviors happen more than once or have the potential to happen more than once.

Bullying includes actions, such as making threats, spreading rumors,

attacking someone physically or verbally, and excluding someone from a group on purpose. Bullying is not peer conflict, dating violence, hazing, gang violence, harassment (legal definition), or stalking. While these issues may also be problematic, they do not meet the criteria for bullying behavior.

Types of Bullying

There are several types of bullying, and it is not unusual for a bully to utilize more than one type. **Verbal bullying is** saying, or writing mean things and may include behaviors like teasing or name-calling, inappropriate sexual comments, taunting, and threatening to cause harm. **Social bullying is** sometimes referred to as relational bullying. It involves behaviors such as hurting someone's reputation or relationships by purposely excluding them or getting others to exclude them, spreading rumors about someone, or embarrassing someone in public. **Physical bullying is** hurting a person's body or possessions by hitting, kicking, or pinching, spitting, tripping or pushing, taking or breaking someone's things, or making mean or rude hand gestures.

The Roles in Bullying

There are many roles that individuals may take in bullying situations. Kids can bully others, they can be bullied, or they may witness bullying. Some may play more than one role, sometimes being both bullied and the bully. It is important to understand the multiple roles involved in these situations in order to prevent and respond to bullying effectively.

Importance of Not Labeling Kids

When referring to a bullying situation, it is easy to call the kids who bully others "bullies" and those who are targeted "victims," but this may have unintended consequences. When children are labeled as "bullies" or "victims," it may send the message that the individual's behavior cannot change. It also fails to recognize the multiple roles one might play in different bullying situations. Labeling also disregards other factors contributing to the behavior such as peer influence or school climate.

Instead of labeling the teens involved, focus on the behavior. For instance, instead of calling someone a "bully," refer to them as "the person who bullied." Instead of calling a person a "victim," refer to them as "the person who was bullied."

The Role of Bully

The roles individuals play in bullying are not limited to those who bully others and those who are bullied. Some researchers talk about the "circle of bullying" to define both those directly involved in bullying and those who actively or passively assist the behavior or defend against it. Direct roles include:

- **Those who Bully**: These teens engage in bullying behavior towards their peers. There are many risk factors that may contribute to their involvement in the behavior. Often, these kids require support to change their behavior and address any other challenges that may be influencing their behavior.
- **Those who are Bullied**: These teens are the targets of bullying behavior. Some factors put them at more risk of being bullied, but not all kids with these characteristics will be bullied. Sometimes, these individuals may need help learning how to respond to bullying.

Witnesses to Bullying

Even if a person is not directly involved in bullying, they may be contributing to the behavior. Witnessing the behavior may also affect the situation, so they need to learn what they should do when they see bullying happen. Roles kids play when they witness bullying include:

- **Those who Assist**: These individuals may not start the bullying or lead in the bullying behavior, but serve as an "assistant" to those who are bullying. These kids may encourage bullying behavior and occasionally join in.
- **Those who Reinforce**: These kids are not directly involved in the bullying behavior, but they give the bullying an audience. They will often laugh or provide support for those who are engaging in bullying. This may encourage the bullying to continue.
- **Outsiders**: These individuals remain separate from the bullying situation. They neither reinforce the bullying behavior nor defend the person being bullied. Some may watch what is going on but do not provide feedback about the situation to show they are on anyone's side. Even so, providing an audience may encourage bullying behavior. These witnesses may want to help but do not know-how.
- **Those who Defend**: These witnesses actively comfort the person being bullied and may come to their defense when bullying occurs.

Most participants play more than one role in bullying over time. In some cases, they may be directly involved in bullying as the one bullying others or being bullied. In others, they may witness bullying and play an assisting or defending role. Every situation is different. Some kids are both bullied and bully others. It is important to note the multiple roles kids play, because those who are both bullied and bully others may be at more risk for adverse outcomes, such

as depression or suicidal ideation. Also, it highlights the need to engage all kids in prevention efforts, not just those who are known to be directly involved.

Bystanders: Become an Upstander to Bullying

Video 2. *Bystander* discusses the roles of a bullying incident and how bystanders may be key to preventing and stopping bullying.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=109#oembed-2

Who Is at Risk?

No single factor puts a child at risk of being bullied or bullying others. Bullying can happen anywhere—cities, suburbs, or rural towns. Depending on the environment, some groups—such as lesbian, gay, bisexual, transgender, or questioning (LGBTQ) youth, youth with disabilities, and socially isolated youth—may be at an increased risk of being bullied.

Those at Risk of Being Bullied

Generally, those who are bullied have one or more risk factors. Adolescents that are perceived as different from their peers, such as being overweight or underweight, wearing glasses or different clothing, being new to a school, or being unable to afford what kids consider "cool" are at risk for bullying. As are those perceived as weak or unable to defend themselves or are less popular than others and have few friends. Also, at risk for bullying are those that are depressed, anxious, or have low self-esteem. Finally, those that do not get along well with others, are seen as annoying or provoking, or antagonize others for attention are more likely to be bullied. However, even if a child has these risk factors, it does not mean that they will be bullied.

Those More Likely to Bully Others

There are two types of kids who are more likely to bully others. The first is well-connected to their peers, have social power, are overly concerned about their popularity, and like to dominate or be in charge of others. The others are more isolated from their peers and may be depressed or anxious, have low self-esteem, be less involved in school, be easily pressured by peers, or not identify with the emotions or feelings of others.

There are specific risk factors that make someone more likely to bully others. Those that are aggressive or easily frustrated, have difficulty following rules, and view violence in a positive way are more likely to bully. Also, those that think badly of others and have friends who bully are at higher risk for the same behavior. Finally, kids that have less parental involvement or are having issues at home may display more bullying behaviors.

Remember, those who bully others do not need to be stronger

or bigger than those they bully. The power imbalance can come from several sources—popularity, strength, cognitive ability—and children who bully may have more than one of these characteristics.

Warning Signs of Bullying

There are many warning signs that may indicate that someone is affected by bullying—either being bullied or bullying others. Recognizing the warning signs is an essential first step in taking action against bullying. Not all children who are bullied or are bullying others ask for help.

It is important to talk with children who show signs of being bullied or bullying others. These warning signs can also point to other issues or problems, such as depression or substance abuse. Talking to the child can help identify the root of the problem.

Signs of Being Bullied

Look for changes in the child. However, be aware that not all children who are bullied exhibit warning signs. Some signs that may point to a bullying problem are unexplainable injuries or lost and destroyed clothing, books, electronics, or jewelry. Those being bullied may report frequent headaches or stomach aches, feeling sick or faking illness. They may have changes in eating habits, like suddenly skipping meals or binge eating. Kids may come home from school hungry because they did not eat lunch. They may also have difficulty sleeping or frequent nightmares.

Signs of Bullying Others

Kids may be bullying others if they get into physical or verbal fights or have friends who bully others. They may demonstrate increasing levels of aggressive behavior and get sent to the principal's office or detention frequently. They may also have unexplained extra money or new belongings.

Why Don't Kids Ask for Help?

Statistics from the 2012 Indicators of School Crime and Safety show that an adult was notified in less than half (40%) of bullying incidents. Kids do not tell adults for many reasons. Fo one, bullying can make a child feel helpless. Kids may want to handle it on their own to feel in control again. They may fear being seen as weak or a tattletale. Kids may fear backlash from the kid who bullied them. Bullying can be a humiliating experience. Kids may not want adults to know what is being said about them, whether true or false. They may also fear that adults will judge them or punish them for being weak. Kids who are bullied may already feel socially isolated. They may feel like no one cares or could understand. Finally, kids may fear being rejected by their peers. Friends can help protect kids from bullying, and kids can fear of losing this support.

Effects of Bullying

Bullying can affect everyone—those who are bullied, those who bully, and those who witness bullying. Bullying is linked to many negative outcomes, including impacts on mental health, substance use, and suicide. It is important to talk to kids to determine whether bullying—or something else—is a concern.

Kids Who Are Bullied

Kids who are bullied can experience negative physical, school, and mental health issues. Kids who are bullied are more likely to experience depression and anxiety, increased feelings of sadness and loneliness, changes in sleep and eating patterns, and loss of interest in activities they used to enjoy. These issues may persist into adulthood. They may have more health complaints. Decreased academic achievement and school participation is a common effect of being bullied. They are also more likely to miss, skip, or drop out of school. A very small number of bullied kids might retaliate through extremely violent measures. In 12 of 15 school shooting cases in the 1990s, the shooters had a history of being bullied.

Kids Who Bully Others

Kids who bully others can also engage in violent and other risky behaviors into adulthood. Kids who bully are more likely to abuse alcohol and other drugs in adolescence and as adults. They are also more likely to get into fights, vandalize property, and drop out of school. They have criminal convictions and traffic citations as adults. They may engage in early sexual activity. They are also more likely to be abusive toward their romantic partners, spouses, or children as adults.

Bystanders

Kids who witness bullying are more likely to miss or skip school. They are also more like to use tobacco, alcohol, or other drugs. Bystanders are at increased risk of developing mental health problems, including depression and anxiety.

The Relationship Between Bullying and Suicide

Media reports often link bullying with suicide. However, most youth who are bullied do not have thoughts of suicide or engage in suicidal behaviors. Although kids who are bullied are at risk of suicide, bullying alone is not the cause. Many issues contribute to suicide risk, including depression, problems at home, and trauma history. Additionally, specific groups have an increased risk of suicide, including American Indian and Alaskan Native, Asian American, lesbian, gay, bisexual, and transgender youth. This risk can be increased further when these kids are not supported by parents, peers, and schools. Bullying can make an unsupportive situation worse.

Special Concern: Cyberbullying

Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets. Cyberbullying can occur through SMS, Text, and apps, or online in social media, forums, or gaming where people can view, participate in, or share content. Cyberbullying includes sending, posting, or sharing negative, harmful, false, or mean content about someone else. It can include sharing personal or private information about someone else, causing embarrassment or humiliation. Some cyberbullying crosses the line into unlawful or criminal behavior.

With the prevalence of social media and digital forums, comments, photos, posts, and content shared by individuals can often be viewed by strangers, as well as acquaintances. The content an individual shares online — both their personal content as well as any negative, mean, or hurtful content — creates a kind of permanent public record of their views, activities, and behavior. This public record can be thought of as an online reputation, which

may be accessible to schools, employers, colleges, clubs, and others who may be researching an individual now or in the future. Cyberbullying can harm the online reputations of everyone involved – not just the person being bullied, but those doing the bullying or participating in it. Cyberbullying has unique concerns in that it can be:

- **Persistent**: Digital devices offer the ability to immediately and continuously communicate 24 hours a day, so it can be difficult for children experiencing cyberbullying to find relief.
- **Permanent**: Most information communicated electronically is permanent and public, if not reported and removed. A negative online reputation, including for those who bully, can impact college admissions, employment, and other areas of life.
- **Hard to Notice**: Because teachers and parents may not overhear or see cyberbullying taking place, it is harder to recognize.

Cyberbullying and Online Gaming

Playing video games is a popular activity, with 72 percent of teens gaming online. Many video games — whether they are console, web, or computer-based — allow users to play with friends they know in person and others they have met only online. While gaming can have positive benefits like making new friends, socializing, and learning how to strategize and problem solve, it is also another place where cyberbullying occurs.

The anonymity of players and the use of avatars allow users to create alter-egos or fictional versions of themselves, which is part of the fun of gaming. However, it also allows users to harass, bully, and sometimes gang up on other players, sending or posting negative or hurtful messages and using the game as a tool of harassment. If someone is not performing well, other children may curse or make

negative remarks that turn into bullying, or they might exclude the person from playing together.

Because players are anonymous, they cannot necessarily be held accountable for their behavior, and their harassment can cause some players to leave games. Some anonymous users use the game as a means to harass strangers or to get their personal information, like user names and passwords.

There are things adults can do to prevent cyberbullying of children who are gaming. Parents should play the game or observe when the gaming happens to understand how it works and what a child is exposed to in the game. Check-in periodically with children about who is online, playing the game with them. Teach children about safe online behavior, including not clicking on links from strangers, not sharing personal information, not participating in bullying behavior of other players, and what to do if they observe or experience bullying. Establish rules about how much time a child can spend playing video games.

Warning Signs of Cyberbullying

Many of the warning signs that cyberbullying is occurring happen around a child's use of their device. Some of the warning signs that a kid may be involved in cyberbullying include noticeable increases or decreases in device use. Kids may exhibit unusual emotional responses (laughter, anger, upset) to what is happening on their device. A teen hides their screen or device when others are near, and avoids discussion about what they are doing on their device. There may be sudden changes to social media accounts, with accounts being shut down or new ones appear. If a teen starts to avoid social situations, even those that were enjoyed in the past. Alternatively, if they become withdrawn or depressed, or loses interest in people and activities.

What to Do When Cyberbullying Happens

When warning signs that a child may be involved in cyberbullying, adults should take steps to investigate that kid's digital behavior. Cyberbullying is a form of bullying, and adults should take the same approach to address it: support the person being bullied, address the bullying behavior of a participant, and show all involved that cyberbullying is taken seriously. Because cyberbullying happens online, responding to it requires different approaches. If an adult thinks that cyberbullying is occurring, several things can be done. First, *recognize* if there has been a change in mood or behavior and explore what the cause might be. Try to determine if these changes happen around a child's use of their digital devices. *Ask* questions to learn what is happening, how it started, and who is involved. *Document* what is happening and where. Take screenshots of harmful posts or content, if possible. Most laws and policies note that bullying is a repeated behavior, so records help to document it. *Report* issues to social media platforms and refer to the school's reporting policies. If a child has received physical threats, or if a potential crime or illegal behavior is occurring, report it to the police. *Provide support*. Peers, mentors, and trusted adults can sometimes intervene publicly to positively influence a situation where negative or hurtful content posts about a child. Public Intervention can include posting positive comments about the person targeted with bullying to try to shift the conversation in a positive direction. It can also help to reach out to the child who is bullying and the target of the bullying to express concern. If possible, try to determine if more professional support is needed for those involved, such as speaking with a guidance counselor or mental health professional.

Watch it

Video 3. *Ways to Stop Bullying.*

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Play

While play is often seen as something children do for leisure and recreation, play is actually a crucial part of a children's development. Play is a self-chosen and self-directed activity that is focused on the process of play and not the product of it. Play is individually constructed to meet the child's desires and needs. Finally, play is imaginative and active (Gray, 2013). Play is children's work. Through play, children develop cognitive skills and learn new information. They learn and practice social skills, like effective communication, self-regulation, conflict resolution, problem-solving, and cooperation. Furthermore, they learn about themselves by exploring roles, interests, skills, and relationships. Play is how children explore their world.

Types of Play

According to Piaget, children engage in types of play that reflect their level of cognitive development. Originally proposing three levels of play: functional play, symbolic play, and games with rules. Smilansky expanded on Piaget's model to add a fourth level: constructive play. Each type of play emerges at different ages and stages of cognitive development, and the prominence of the level of play changes with maturation, as well (Johnson, Christie & Wardle 2005).

Functional Play

Functional play is the first type of play activity in which children engage. Functional play involves repetitive, physical actions, language, and manipulation of objects. Beginning in infancy, children learn that they have control of their bodies and objects, and they can act upon those objects. Infants play through repetitive actions, like shaking a rattle, splashing in the bath, or repeatedly dropping toys from their high chair. These basic actions become play when the child deliberately engages in the activity for pleasure (Frost, 1992). Eventually, as children become more cognitively sophisticated, simple, repetitive actions are replaced by more complex, coordinated actions. Functional play is enjoyed by children throughout their childhood, particularly as they discover and practice new motor skills, such as sliding, climbing, stacking, jumping, and bouncing.

Constructive Play

By the age of two, children progress from simple, repetitive functional play to goal-directed, creative activities. When children manipulate objects to create something, they are engaging in **constructive play.** They use objects like blocks, clay, and craft supplies in an organized way to achieve a goal. Constructive play is a form of hand-on inquiry where children gain knowledge by posing questions, testing ideas, and gathering information (Drew et al., 2008) through experimentation with basic materials to create

something more complex. This type of play encourages planning, exploration, and discovery (Child Development Institute, 2010).

Constructive play facilitates the development of imagination, problem-solving skills, fine motor skills, and self-esteem. Build with blocks help children learn spatial relationships. Manipulating objects can translate into comfort with manipulating words, ideas, and concepts. This type of play prepares children for later academic, social, and emotional successes (Leong & Bodrova, 2015) and to be flexible thinking (Bruner 1972). Creating encourages the development of positive self-esteem by offering children power over their environment and a sense of accomplishment (Chaille, 2008). Constructive play also helps children develop character virtues, such as tenacity, flexibility, creativity, courage, enthusiasm, persistence, and adaptability (Child Development Institute, 2010).

Young children tend to prefer constructive play. When given a choice of play activities, preschool children choose constructive play more than 50% of the time (Rubin, Fein, & Vandenberg 1983). Further, constructive play is a way to scaffold play as children transition from function to symbolic play. Children should be encouraged to engage in constructive play by providing children with playtime and play materials for exploration. Providing inspiring materials is key to promoting constructive play.

Symbolic Play

Symbolic play is the ability of children to use objects, actions, or ideas to represent other objects, actions, or ideas in play. These activities may include role-playing or make-believe play, such as

pretending to be a baby, firefighter, or monster, and make-believe actions, such as driving a car by moving a pretend steering wheel, or using a banana as a telephone. This level of play is widely considered the most sophisticated play activity during the preschool and kindergarten years. Symbolic play encourages the development of social skills, academic abilities, early literacy concepts, and behavioral self-regulation (Leong & Bodrova 2015).

At around 18-months-old, toddlers begin to engage in pretend play, and type of symbolic play. They use objects to represent something else, like drinking from an empty cup or pretending to feed a doll. As children advance cognitive, linguistically, and socially, their play begins to include fantasy, drama, and imitation. Preschoolers are more capable of playing roles and incorporating social norms in their pretend play. Their role-plays and imagination become more sophisticated, and socialization becomes an important aspect of their play activities. Children assign roles to themselves and others, and their interactions often involve sequenced steps and a predetermined plan. Pretend play allows children to explore various roles and expectations and do participate in activities that they may not otherwise be allowed to explore in the real world. Through pretend play, children learn skills in negotiation, listening, sharing, taking turns, and respecting others' feelings, thoughts, ideas, and physical space.

The sophistication of symbolic play progresses through several substages. The substages include either the child acting a role, the child using an agent to act a role (such as a doll), or a group of children with different roles. These stages also include different types of objects in the play activity. Children may use objects that resemble the real-life object that this represents, such as using toy food to represent real food. Alternatively, the child may use

nonrealistic objects to represent real-life objects, such as using a stick as a for a horse.

Tabel 1. Substages of symbolic play development

Single pretend transformation toward self with realistic objects	Child takes role and uses object that resembles the real object, such as the child pretending to eat toy food.
Object is pretend agent with realistic objects	Child uses object that resembles real objects and that object is treated as if it acts, such as the child has a doll and act as if it is eating.
Single pretend transformation with nonrealistic object	Child uses object that has no resemblance to real objects, such as the child forms a pancake from molding clay.
Pretend role with realistic object	Child uses objects associated with a role that resembles real objects, such as the child pretends to be a cook with toy food.
Multiple pretend role transformations with realistic object	Child uses objects that resemble real-world objects while the child takes roles, such as doctor, patient, and nurse while playing with dolls or toy animals.
Pretend role with nonrealistic object	Child uses objects that have no resemblance to real objects, such as using molding clay to construct a farm.
Multiple pretend roles with realistic object	Children use objects that resemble real objects, such as a group of children use a toy doctor's kit and play the roles as doctor, patient, and nurse.
Multiple pretend roles with nonrealistic object	Children use objects that have no resemblance to real objects, such as molding clay to create the pretend setting and designate roles to enact.
Source: Frost et al., 2001	

> "In play a child is always above his average age, above his daily behavior; in play it is as though he were a head taller than himself. As in
> the focus of a magnifying glass, play contains all developmental tendencies in a condensed form; in play it is

> as though the child were trying to jump above the level of his normal behavior" (Vygotsk,1967, p.16).

While Piaget and others believed different types of play activities were essential to development, Vygotsky's definition of play was limited to pretend play. He believed that play must include the creation of an imaginary situation, assigning and acting out of roles, and following a set of rules specific to those roles (Bodrova & Leong, 2007). Play is a way for children to learn about symbols and separate thoughts from objects. Vygotsky saw play as a means to help children self-gratify. Through play, children can create fantasy situations to get their needs met, regulate emotions, and delay gratification. This level of play also aids children in learning self-regulation by following the rules and adhering to the roles of the play activity. Vygotsky believed that play provided scaffolding for learning to assist children in operating at the upper-end of their zone of proximal development.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=110#oembed-1

Video 1. *Play: A Vygotskian Approach* explains Vygotsky's beliefs about the functions of play.

Smilansky also emphasized the importance of symbolic and pretend play. Her research in this area found that children that did not engage in this level of play displayed cognitive and emotional delays. This effect was especially present in underprivileged children. In response, Smilansky proposed that to facilitate children's development of pretend play, adults should encourage:

1. Imitative role play. The child pretends to play a role and expresses it in an imitates that role. For example, “I am the teacher, and you are my students.”
2. Make-believe with objects. Use nonrealistic objects to represent real objects and actions. For example, pretending a stick is a horse and riding it.
3. Verbal make-believe. Incorporate verbal dialog and descriptions in place of actions. For example, “Let’s pretend I cooked the dinner, and now I am setting the table” when only the last activity is actually imitated.
4. Persistence in role play. The pretend play episode lasts for at least 10 minutes.
5. Interaction. Two or more players interact within the context of a play episode.
6. Verbal communication. There is some verbal interaction with other players related to the play episode (Frost, 1992).

Games with Rules

The final type of play is **games with rules.** At this level, the play activity has imposed rules that must be followed by the players. To successfully participate at this level of play, children must have the cognitive ability to understand and remember the rules. These games also require the children to self-regulation, curbing their own desires and needs to adhere to the rules of the game. Games with rules are often characterized by logic and order, and as

children mature they can develop methods and planning in their game playing (Frost et al., 2004).

Through games with rules, school-age children develop an understanding of cooperation and competition. By initiating their own games with rules, children learn the need for rules, how to negotiate with each other, and fairness so that the game is enjoyable for everyone. Team sports and board games are games that have very specific rules and encourage the development of strategy. Electronic games are designed to target children at different stages of development and often encourage the practice and mastery of new skills through challenging tasks and fantasy (Frost et al., 2001).

Parten's Stages of Social Play

As we consider how play develops through childhood, we must also examine changes in socialization during playing. As children mature, they progress through several stages of non-social and social play. Parten's stages of social play is a theory that categorizes the ways in which children may socialize while participating in play during different periods of development. Parten observed American children at free play and recognized six different types of play. Three types she labeled as non-social (unoccupied, solitary, and onlooker), and three types were categorized as social play (parallel, associative, and cooperative). Parten also found that once a child has developed the ability to participate in a particular stage of social play, they will use combinations of that stage and earlier stages while playing. However, we find that younger children engage in non-social play more than those older and, by age five, associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006).

Unoccupied

The earliest and least common style of play throughout childhood is the **unoccupied** stage. This is a non-social stage that starts in infancy and may appear as random behavior without a specific goal. During this time, the child is not playing. Sitting or standing still, random movements or movements without purpose that do not meet the above definition of play can all be considered unoccupied time. Infants and toddlers may spend significant parts of their day disengaged from any play, but the amount of time spent unoccupied should decrease as children age.

Solitary Play

Another non-social stage is **solitary play**. Common in children 2-3 years of age, this style of play involves a child playing alone and maintaining focus on their activity. They do not interact with others, nor are they interested in what others are doing. They also are not engaging in similar activities as the children around them. No matter the play activity, whether functional, constructive, symbolic, or game play, if the child is playing alone then it is solitary play.

Onlooker Play

Onlooker play is the final type of non-social play. During this style of play, children are observing others playing. The child may socialize with the other children, such as commenting on the activities and even make suggestions, but they will not directly join the play. Onlooker play is different from unoccupied play because, while the child is not participating in the play activity, they are engaged in social interaction and active observation. Children can still benefit from play activities that they observe, possibly learning behavior and rules before attempting participation.

Parallel Play

Sometimes seen as a transitory stage from immature non-social types to the more socially mature types of play, **parallel play** is when a child plays adjacent to, but not with, others. The child plays separately from others, engaged in their own play with their own goals; however, the children are close enough to observe and mimicking other's behaviors.

Associative Play

Around the age of 3, children will interact with each other and share toys; however, they are not yet working toward a common play goal. This more sophisticated social contact is **associative play**. The children will engage in the same play activity and show interest in what others are doing, but not in coordinating their activities with those people. There is a substantial amount of interaction involved, but the activities are not in sync.

Cooperative Play

When children are interacting to achieve a common goal, this is **cooperative play**. The child is interested both in the people playing and in coordinating their activities. In cooperative play, the activity is organized, participants have assigned roles, and children may take on different tasks to reach their shared goal. There is also increased self-identification with a group, and a group identity may emerge. This style of play is more common toward the end of the early childhood stage. Examples would be dramatic play activities with roles, like playing school, or a game with rules, such as freeze tag.

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Video 2. *The 6 Types of Play* provides an overview of Parten's stages of social play.

Imaginary Companions

An intriguing occurrence in early childhood is the emergence of imaginary companions. Researchers differ in how they define what qualifies as an imaginary companion. Some studies include only invisible characters that the child refers to in conversation, or plays with for an extended period. Other researchers also include objects that the child personifies, such as a stuffed toy or doll, or characters the child impersonates every day. Estimates of the number of children who have imaginary companions vary greatly (from as little as 6% to as high as 65%) depending on what is included in the definition (Gleason, Sebanc, & Hartup, 2000).

Little is known about why children create imaginary companions, and more than half of all companions have no obvious trigger in the child's life (Masih, 1978). Imaginary

companions are sometimes based on real people, characters from stories, or simply names the child has heard (Gleason et al., 2000). Imaginary companions often change over time. In their study, Gleason et al. (2000) found that 40% of the imaginary companions of the children they studied changed, such as developing superpowers, switching age, gender, or even dying, and 68% of the characteristics of the companion were acquired over time. This could reflect greater complexity in the child's "creation" over time and/or a greater willingness to talk about their imaginary playmates.

In addition, research suggests that contrary to the assumption that children with imaginary companions are compensating for poor social skills, several studies have found that these children are very sociable (Mauro, 1991; Singer & Singer, 1990; Gleason, 2002). However, studies have reported that children with imaginary companions are more likely to be first-borns or only-children (Masih, 1978; Gleason et al., 2000; Gleason, 2002). Although

not all research has found a link between birth order and the incidence of imaginary playmates (Manosevitz, Prentice, & Wilson, 1973). Moreover, some studies have found little or no difference in the presence of imaginary companions and parental divorce (Gleason et al., 2000), the number of people in the home, or the amount of time children are spending with real playmates (Masih, 1978; Gleason & Hohmann, 2006).

Do children treat real friends differently? The answer appears to be not really. Young children view their relationship with their imaginary companion to be as supportive and nurturing as with their real friends. Gleason has suggested that this might suggest that children form a schema of what is a friend, and use this same schema in their interactions with both types of friends (Gleason et al., 2000; Gleason, 2002; Gleason & Hohmann, 2006).

Behavioral and Psychological Adjustment

With all of these brain changes and novel experiences, we expect to see children undergo significant behavioral and psychological adjustments. Adolescents, especially, are facing strong emotions, changing peer relationships, more independence, expectations to be more adult-like, and a desire to take risks, all while lacking a fully mature brain or the life experience to navigate these situations. It is inevitable that some mistakes will occur along the way, as well as a great deal of learning. We will examine some significant adjustment issues encountered by children and adolescents: aggression, drug use, anxiety, depression, and self-violence.

Aggression and Antisocial Behavior

Several major theories of the development of antisocial behavior treat childhood as an important period. Patterson's (1982) '*early versus late starter model*' of the development of aggressive and antisocial behavior distinguishes youths whose antisocial behavior begins during childhood (early starters) versus adolescence (late starters). According to the theory, early starters are at greater risk for long-term antisocial behavior that extends into adulthood than are late starters. Late starters who become antisocial during

adolescence are theorized to experience poor parental monitoring and supervision, aspects of parenting that become more salient during adolescence. Poor monitoring and lack of supervision contribute to increasing involvement with deviant peers, which, in turn, promotes adolescents' own antisocial behavior. Late starters desist from antisocial behavior when changes in the environment make other options more appealing.

Similarly, Moffitt's (1993) '*life-course-persistent versus adolescent-limited model*' distinguishes between antisocial behavior that begins in childhood versus adolescence. Moffitt regards adolescent-limited antisocial behavior as resulting from a "maturity gap" between adolescents' dependence on and control by adults and their desire to demonstrate their freedom from adult constraint. However, as they continue to develop, and legitimate adult roles and privileges become available to them, there are fewer incentives to engage in antisocial behavior, leading to discontinuation of these antisocial behaviors.

Psychology and Mass Shootings

Virginia Tech, Columbine, Stoneman Douglas High School, Santa Fe High School, Sandy Hook, Aurora, Las Vegas, Orlando—all sites of horrific and tragic mass shootings. Why are they so common? And what led the perpetrators to commit these acts of violence? Several possible factors may work together to create a fertile environment for mass murder in the United States. Most commonly suggested include:

- Higher accessibility and ownership of guns. The U.S. has the highest per-capita gun ownership in the world with 120.5 firearms per 100 people; the second

highest is Yemen with 52.8 firearms per 100 people

- Mental illness and its treatment (or the lack thereof) with psychiatric drugs. This is controversial. Many of the mass shooters in the U.S. suffered from mental illness, but the estimated number of mental illness cases has not increased as significantly as the number of mass shootings. Under 5% of violent behaviors in the U.S. are committed by persons with mental health diagnoses. A 2002 report by the U.S. Secret Service and U.S. Department of Education found evidence that a majority of school shooters displayed evidence of mental health symptoms, often undiagnosed or untreated. Criminologists Fox and DeLateur note that mental illness is only part of the issue, however, and mass shooters tend to externalize their problems, blaming others, and are unlikely to seek psychiatric help, even if available. Other scholars have concluded that mass murderers display a common constellation of chronic mental health symptoms, chronic anger or antisocial traits, and a tendency to blame others for problems. However, they note that attempting to "profile" school shooters with such a constellation of traits will likely result in many false positives as many individuals with such a profile do not engage in violent behaviors.
- The desire to seek revenge for a long history of being bullied at school. In recent years, citizens calling themselves "targeted individuals" have cited adult bullying campaigns as a reason for their deadly violence.
- The widespread chronic gap between people's

expectations for themselves and their actual achievement, and individualistic culture.

- The desire for fame and notoriety. Also, mass shooters learn from one another through "media contagion," that is, "the mass media coverage of them and the proliferation of social media sites that tend to glorify the shooters and downplay the victims."
- The copycat phenomenon.
- Failure of government background checks due to incomplete databases and/or staff shortages.

For additional Information: Mass Violence in America, by The National Council for Behavioral Health

Behavior and Conduct Problems

Children and adolescents sometimes argue, are aggressive, or act angry or defiant around adults. A behavior disorder may be diagnosed when these disruptive behaviors are uncommon for the child's age at the time, persist over time, or are severe. Because disruptive behavior disorders involve acting out and showing unwanted behavior towards others they are often called **externalizing disorders**.

Oppositional Defiant Disorder

When children act out persistently so that it causes serious problems at home, in school, or with peers, they may be diagnosed with Oppositional Defiant Disorder (ODD). ODD usually starts before 8 years of age, but no later than by about 12 years of age. Children with ODD are more likely to act oppositional or defiant around people they know well, such as family members, a regular care provider, or a teacher. Children with ODD show these behaviors more often than other children their age.

Examples of ODD behaviors include

- Often being angry or losing one's temper
- Often arguing with adults or refusing to comply with adults' rules or requests
- Often resentful or spiteful
- Deliberately annoying others or becoming annoyed with others
- Often blaming other people for one's own mistakes or misbehavior

Conduct Disorder

Conduct Disorder (CD) is diagnosed when children show an ongoing pattern of aggression toward others, and serious violations of rules and social norms at home, in school, and with peers. These rule violations may involve breaking the law and result in arrest. Children with CD are more likely to get injured and may have difficulties getting along with peers.

Examples of CD behaviors include

- Breaking serious rules, such as running away, staying out at night when told not to, or skipping school
- Being aggressive in a way that causes harm, such as bullying, fighting, or being cruel to animals
- Lying, stealing, or damaging other people's property on purpose

Diagnosing Behavior Disorders

Learn about the guidelines for diagnosing and treating ODD and CD

Treatment for Disruptive Behavior Disorders

Starting treatment early is important. Treatment is most effective if it fits the needs of the specific child and family. The first step to treatment is to talk with a healthcare provider. A comprehensive evaluation by a mental health professional may be needed to get the right diagnosis. Some of the signs of behavior problems, such as not following rules in school, could be related to learning problems that may need additional intervention. For younger children, the treatment with the strongest evidence is behavior therapy training for parents, where a therapist helps the parent learn effective ways to strengthen the parent-child relationship and respond to the child's behavior. For school-age children and teens, an often-used effective treatment is a combination of training and therapy that includes the child, the family, and the school.

Managing Symptoms: Staying Healthy

Being healthy is important for all children and can be especially important for children with behavior or conduct problems. In addition to behavioral therapy and medication, practicing certain healthy lifestyle behaviors may reduce challenging and disruptive behaviors your child might experience. Here are some healthy behaviors that may help:

- Engaging in regular physical activity, including aerobic and vigorous exercise
- Eating a healthful diet centered on fruits, vegetables, whole grains, legumes (for example, beans, peas, and lentils), lean protein sources, and nuts and seeds
- Getting the recommended amount of sleep each night based on age
- Strengthening relationships with family members

Prevention of Disruptive Behavior Disorders

It is not known exactly why some children develop disruptive behavior disorders. Many factors may play a role, including biological and social factors. It is known that children are at greater risk when they are exposed to other types of violence and criminal behavior, when they experience maltreatment or harsh or inconsistent parenting, or when their parents have mental health conditions like substance use disorders, depression, or attention-deficit/hyperactivity disorder (ADHD). The quality of early childhood care also can impact whether a child develops behavior problems.

Although these factors appear to increase the risk for disruptive behavior disorders, there are ways to decrease the chance that

children experience them. Learn about public health approaches to prevent these risks:

- Positive parenting strategies for young children
- Child maltreatment prevention
- Youth violence prevention
- Bullying prevention
- Mental health in adults
- Finding high-quality child care

Substance Use

Adolescence is a time of rapid change and maturation. It is also a time of experimentation—with new hairstyles, clothes, attitudes, and behaviors. Some of these experiments are harmless. Others, such as using alcohol or other drugs, can have long-lasting harmful consequences. There are several reasons why it is important to identify and treat adolescent substance use.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=111#oembed-1

Video 1. *Adolescent Substance Use, Addiction, and Treatment* discusses the prevalence of substance use and teens' susceptibility to abuse.

Substance use is common among adolescents. Alcohol, marijuana, and tobacco are the substances most commonly used by youth

(Johnston et al., 2014), and alcohol often is the first substance to be used (Johnston et al., 2010). The percentage of young people who have used alcohol increases with age. By eighth grade, 28% of students have tried alcohol, and 12% have been drunk at least once; by twelfth grade, 68% of students have tried alcohol, and more than half have been drunk at least once (Johnston et al., 2014). In 2012, 45% of students in grades 9 through 12 reported ever having used marijuana, and 24% reported having used marijuana in the preceding 30 days. Between 2008 and 2012, the proportion of teens who used marijuana daily increased from 5% to 8% (PDFA, 2013). According to a survey published in 2014, 41% of students in grades 9 through 12 reported having tried cigarettes. Nearly one-quarter said they had used tobacco in some form in the past 30 days (Kann et al., 2014). A substantial percentage of adolescents, including 15% of 12th graders, report misuse (i.e., use without a prescription) of prescription medication, especially stimulants and pain medications (Johnston et al., 2014).

Why do Adolescents use Drugs?

As we read above, most adolescents will use drugs or alcohol before reaching adulthood; however, the reasons for use can vary greatly. A popular model for understanding the reasons and levels of drug use involves viewing the behavior as a continuum. This continuum includes non-use and experimental drugs, casual, habitual, and compulsive drug use.

A non-user is someone that has never misuse drugs. An experimental user has used drugs a few times out of curiosity. Using substances may make them feel 'grown-up,' or they may do it as a form of rebellion against authority or rules. Using may be exciting for this teen. Typically, experimental users have no significant problems with drug use, and adults are not likely aware of the use.

When substance use becomes more common among peer groups,

teens are more likely to engage in social use. Using drugs or alcohol might be a way of fitting in with some social groups or with friends. Teens may feel that they are more outgoing or social when under the influence of substances. Furthermore, some teens may use substances for fun or out of boredom. There may also be circumstantial-situational reasons for substance use, such as increasing awareness or creativity and lowering inhibitions. These casual users might engage in regular drug use, maybe 2 to 4 times per week. They still associate drug use with feeling excited or stimulated, and they make efforts to maintain control of their use. Their substance use may be frequent enough that the behavior is difficult to hide from parents and school officials. Casual users may experience decreased school performance, loss of interest in previously enjoyed activities that do not involve drug use, and other atypical behaviors for the adolescent (e.g., increased lying).

As we see substance use intensify, the concern for the teen's health and safety increases. A habitual user is likely to use drugs daily, often with a particular group of friends that are also using. Drug use may be part of the group's norms and identity. Teens may also use substances to escape or to self-medicate. At this level of use, the teen may not necessarily lose control but experiences significant school and family problems. Drug use may no longer bring the excitement and stimulation previously sought. Instead, the adolescent may become impulsive, erratic, guilt-ridden, and depressed.

A compulsive user has lost control over their drug use. The person is using drugs several times per day, and they spend a significant part of their day in the procurement, maintenance, and use of a regular drug supply. These adolescents engage in behaviors that put their health and safety at risk. Their emotional state is often disorganized. Individuals in the last three categories – casual, habitual, and compulsive – are most likely to qualify for a substance use disorder diagnosis.

Risk Factors for Substance Abuse

There are certain factors that increase the risk of adolescent substance abuse. Teens that come from dysfunctional families or live in poverty are at higher risk of abuse. As are youth raised in cultures or communities where substance abuse is common. Adolescents that struggle academically or are lacking in social skills may also see higher rates of substance abuse. A highly concerning risk factor is early substance use. The earlier and the more a young person uses substances, the higher risk they are for developing a substance disorder.

Substance use has its own risks and also is associated with other risky behaviors. Adolescent substance use poses both short-term and long-term risks. In the short term, drinking, for example, can result in unintentional injuries and death, suicidal behavior, motor vehicle crashes, intimate partner violence, and academic and social problems (Brown et al., 2008; Cole et al., 2011; Weitzman Nelson, 2004). These outcomes occur because excess alcohol consumption leads to decreased cognitive abilities, inaccurate perception of risk, and impaired bodily control. These effects, in combination with the fact that compared to adults, adolescents tend to be more physically active when under the influence of alcohol, put adolescents at greater risk of harm. For example, at blood alcohol concentrations greater than zero, adolescents are at increased risk of being fatally injured or involved in fatal crashes in single, two, and more vehicles compared with sober male drivers ages 21-34 (Voas et al., 2012). Marijuana use is associated with diminished lifetime achievement (Meier et al., 2012). Tobacco use results in poor health in the short and long term, and it can be a gateway to the use of other drugs (Sims, 2009). The risk of substance use is compounded because it is associated with other risky behaviors, such as unplanned, unprotected sex, which can result in pregnancy (Brown, 2008; Levy et al., 2009; Tapert et al., 2001). Adolescents who misuse prescription opioids are at high risk of transitioning to injection

drugs and overdosing (McCabe et al., 2012). Any level of substance use can be harmful to adolescents—no amount is safe.

Adolescence is a particularly vulnerable period for brain development and maturation. Adolescence is a long period of intense neurodevelopmental growth and maturation. As a result, the adolescent brain is particularly vulnerable to the toxic effects of alcohol and other drugs and to the potential for addiction. Persistent marijuana use in adolescence, for example, is associated with neuropsychological impairments across a range of functional domains (Meier et al., 2012). Moreover, stopping use does not fully restore neuropsychological functioning, suggesting particular harm to the adolescent brain.

Use tends to increase over time. National estimates of the prevalence of drinking indicate that older youth drink more and drink more heavily than do younger youth (SAMHSA, 2010). This fact makes it all the more important for pediatricians to start early with screening and brief intervention so as to prevent or delay alcohol use for as long as possible.

Substance use in adolescence is associated with harm in adulthood. The earlier an adolescent begins using substances, the greater are his or her chances of continuing to use and of developing substance use problems later in life. For example, compared to people who do not start drinking until they are young adults, people who begin to drink before age 15 are 5 times as likely to develop alcohol dependence or abuse (Chambers et al., 2003; Grant & Dawson, 1997; Hingson & Zha, 2009). Compared with adolescents who first try marijuana at age 18, those who begin using at 14 or younger are 6 times as likely to meet the criteria for illicit drug dependence or abuse later in life (SAMHSA, 2010). More than 80% of adults who smoke tobacco began before they were 18 (Sims, 2009).

Adolescents who report weekly or more frequent substance use are likely to have a severe substance use disorder. In some cases, by the time an adolescent has reached this point, parents are already aware of the drug use, although they may underestimate the

seriousness of the problem. Adolescents with serious substance-use disorders require more-intensive care as soon as possible, including a comprehensive evaluation by a substance use specialist, assessment for co-occurring mental health disorders, and referral to treatment.

Prevention of Substance Abuse

Prevention of substance abuse during adolescence should be a multipronged and long-term approach that involves the education of youth, families, and the community. Prevention education should begin as early as preschool and be specific to the target population (i.e., ethnicity, gender), establishing a culture against substance abuse. Effective programs for teens involve interactive education, such as peer discussions and role-playing, and focus on risk-reduction and fostering good decision-making skills.

D.A.R.E.–the drug prevention program that never worked

The primary goal of Drug Abuse Resistance Education (DARE) was to teach effective peer resistance and refusal skills so that adolescents can say "no" to drugs and their friends who may want them to use drugs. The secondary goals of the program were to build students' social skills and enhance their self-esteem, as these are believed to be linked to adolescent drug use.

DARE was developed in 1983 as a joint effort between the Los Angeles County (Calif.) School District and the Los

Angeles Police Department. In 1986, the U.S. Congress passed the Drug-Free Schools and Communities Act to promote drug abuse education and prevention programs across the country, and DARE spread rapidly, with many school districts adopting it for their students. By 1994, DARE was the most widely used school-based drug prevention program, showing up in all 50 states in the United States and spreading to six foreign countries.

Several large scale studies assessed the effectiveness of the DARE program. The findings consistently found no effects. There were no statistically significant differences between students participating in the DARE program and those that did not when comparing rates of drug use, attitudes toward drug use, or self-esteem.

Anxiety, Depression, And Self-Directed Violent Behavior

Developmental models of anxiety and depression treat adolescence as an important period, especially in terms of the emergence of differences and in prevalence rates that persist through adulthood (Rudolph, 2009). Although the rates vary across specific anxiety and depression diagnoses, rates for some disorders are markedly higher in adolescence than in childhood or adulthood. For example, prevalence rates for anxiety disorders are about 19% in adults, but 32% in adolescents (NIMH, 2017). Adolescents are also more likely to experience depression (13%) compared to adults (7%) (NIMH, 2019). Rates of self-directed violence are also higher among teens

(17%), followed by college students (15%), adults (5%), and children having the lowest rates (1.3%) (APA, 2015).

Anxiety

Occasional anxiety is an expected part of life. You might feel anxious when faced with a problem, before taking a test, or when making an important decision. But anxiety disorders involve more than temporary worry or fear. For a person with an anxiety disorder, the anxiety does not go away and can get worse over time. The symptoms can interfere with daily activities such as job performance, school work, and relationships.

The wide variety of **anxiety disorders** differ by the objects or situations that induce them but share features of excessive anxiety or worry about a variety of things. Fear and anxiety can cause significant problems in areas of their life, such as social interactions, school, and work. Anxiety also manifests in physiological and psychological responses, such as feeling restless, fatigued, difficulty concentrating, irritability, muscle tension, and sleep problems.

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Video 2. *Fight, Flight, Freeze–Anxiety Explained for Teens* identifies symptoms and responses to the experience of anxiety.

The following data pertains to the compiling of statistics for any anxiety disorder including, panic disorder, generalized anxiety

disorder, agoraphobia, specific phobia, social anxiety disorder, post-traumatic stress disorder, obsessive-compulsive disorder, and separation anxiety disorder. An estimated 31.9% of adolescents have an anxiety disorder. Of adolescents with any anxiety disorder, an estimated 8.3% had severe impairment. The prevalence of any anxiety disorder among adolescents was higher for females (38.0%) than for males (26.1%). The prevalence of any anxiety disorder was similar across age groups.

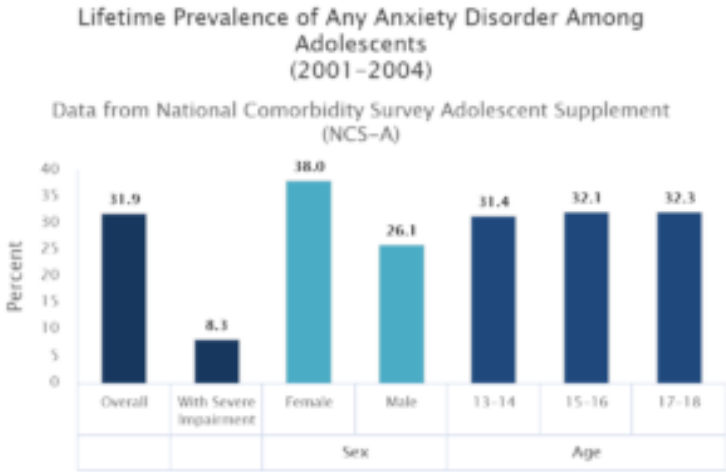

Figure 1. Prevalence of any anxiety disorder among adolescents (2001-2004). Data from the National Comorbidity Survey Adolescent Supplement (NCS-A).

Anxiety disorders are generally treated with psychotherapy, medication, or both. Psychotherapy or "talk therapy" can help people with anxiety disorders. To be effective, psychotherapy must be directed at the person's specific anxieties and tailored to his or her needs. Medication does not cure anxiety disorders but can help relieve symptoms. Medication for anxiety is prescribed by doctors, such as a psychiatrist or primary care provider. The most common

classes of medications used to combat anxiety disorders are anti-anxiety drugs (such as benzodiazepines), antidepressants, and beta-blockers. Some people with anxiety disorders might benefit from joining a self-help or support group and sharing their problems and achievements with others. Talking with a trusted friend or member of the clergy can also provide support, but it is not necessarily a sufficient alternative to care from a doctor or other health professional. Stress management techniques and meditation can help people with anxiety disorders calm themselves and may enhance the effects of therapy. Research suggests that aerobic exercise can help some people manage their anxiety; however, exercise should not take the place of standard care, and more research is needed.

The Prevalence of Mental Illness in youth

Video 3. In *The Prevalence of Mental Illness in* Youth, McKenna Knapp discusses the prevalence of mental health issues in young people and how the pressures to measure up in high school may contribute.

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Depression

Sadness is something we all experience. It is a normal reaction to a loss or a setback, but it usually passes with a little time. Depression is different. Depression (**major depressive disorder**) is a medical illness that can interfere with a person's ability to handle daily activities, such as sleeping, eating, or managing responsibilities. Depression is common, but that doesn't mean it isn't serious. Well-meaning friends or family members may try to tell someone with depression to "snap out of it," "just be positive," but depression is not a sign of weakness or a character flaw. Many people with depression need treatment to get better.

Depression is characterized by feelings of deep sadness and hopelessness that disrupts all normal, regular activities. However, teens may not identify feelings of sadness and instead report feeling more irritable and angry. Often, when depressed, people feel worthless and excessively guilty. They withdraw from activities that they normally enjoy and spend more time alone. Changes in appetite and sleeping habits (more or less than normal) are common. People with depression may experience fatigue, having low energy, and also feel restless. Physical aches and pains with no associated reason may occur, like muscle, stomach, or headaches. Cognitive functioning, such as attention, concentrating, memory, and decision-making, may be impaired. And while not necessary for a depression diagnosis, thoughts of death or suicide may be an issue.

Teens with depression may sulk, get into trouble at school, be negative and irritable, and feel misunderstood. It can be difficult to determine whether an adolescent is depressed or just "being a teenager." Consider how long the symptoms have been present, how severe they are, and how different the teen is acting from his or her usual self. Teens with depression may also have other disorders such as anxiety, eating disorders, or substance abuse.

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Video 4. *Adolescent Depression* provides information on identifying symptoms of depression in teens and how to respond to concerns.

The figure below shows the prevalence of major depressive episodes among U.S. adolescents in 2017. An estimated 3.2 million adolescents aged 12 to 17 in the United States had at least one major depressive episode. This number represented 13.3% of the U.S. population aged 12 to 17. The prevalence of major depressive episodes was higher among adolescent females (20.0%) compared to males (6.8%). The prevalence of major depressive episodes was highest among adolescents reporting two or more races (16.9%).

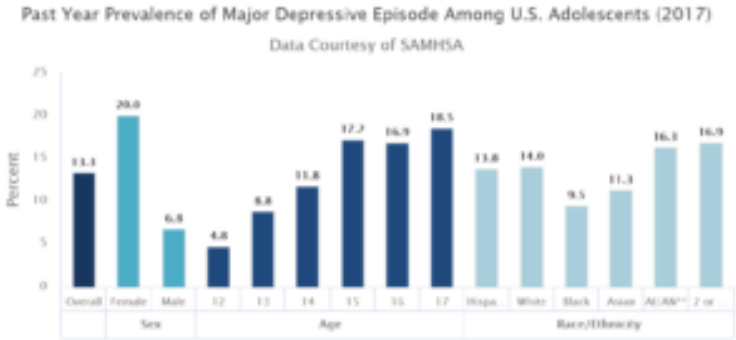

Figure 2. Prevalence of major depressive episode among US adolescents (2017). Data from SAMHSA.

Causes of depression include many factors such as genetics and early childhood experiences that predate adolescence, but puberty may push vulnerable children, especially girls, into despair. During puberty, the rate of major depression more than doubles to an estimated 13%, affecting about one in five girls and one in ten boys. The gender difference occurs for many reasons, biological and cultural (Uddin et al., 2010).

Developmental models focus on interpersonal contexts in both childhood and adolescence that foster depression and anxiety (e.g., Rudolph, 2009). Family adversity, such as abuse and parental psychopathology during childhood, sets the stage for social and behavioral problems during adolescence. Adolescents with such problems generate stress in their relationships (e.g., by resolving conflict poorly and excessively seeking reassurance) and select into more maladaptive social contexts (e.g., "misery loves company" scenarios in which depressed youths select other depressed youths as friends and then frequently co-ruminate as they discuss their problems, exacerbating negative affect and stress). These processes are intensified for girls compared with boys because girls have more relationship-oriented goals related to intimacy and social approval, leaving them more vulnerable to disruption in these relationships. Anxiety and depression then exacerbate problems in social relationships, which in turn contribute to the stability of anxiety and depression over time.

Depression, even in the most severe cases, can be treated. The earlier that treatment can begin, the more effective it is. Depression is usually treated with medications, psychotherapy, or a combination of the two. An estimated 19.6% received care by a mental health professional alone, and another 17.9% received combined care by a mental health professional and medication treatment. Treatment with medication alone was the least common (2.4%). Approximately 60.1% of adolescents with major depressive episodes did not receive treatment.

Antidepressants are medicines that treat depression. They may help improve the way the brain uses certain chemicals that control

mood or stress. Trying several different antidepressant medicines may be necessary before finding the one that improves symptoms and has manageable side effects. Antidepressants take time – usually 2 to 4 weeks – to work, and often, symptoms such as sleep, appetite, and concentration problems improve before mood lifts, so it is important to give medication a chance before reaching a conclusion about its effectiveness.

Several types of psychotherapy (also called "talk therapy" or, in a less specific form, counseling) can help people with depression. Examples of evidence-based approaches specific to the treatment of depression include cognitive-behavioral therapy (CBT), interpersonal therapy (IPT), and problem-solving therapy. CBT can help an individual with depression change negative thinking and interpret the environment and interactions in a positive, realistic way. IPT is designed to help an individual understand and work through troubled relationships or major issues that may cause depression or make it worse.

Teenagers usually rely on parents, teachers, or other caregivers to recognize their suffering and get them the treatment they need. Many teens don't know where to go for mental health treatment or believe that treatment won't help. Others don't get help because they think depression symptoms may be just part of the typical stress of school or being a teen. Some teens worry about what other people will think if they seek mental health care.

Self-Directed Violence

Self-directed violence (SDV) encompasses a range of violent behaviors, including acts of fatal and nonfatal suicidal behavior, and non-suicidal self-injury (i.e., behaviors where the intention is not to kill oneself, as in self-mutilation). Recognizing signs of self-directed violence and interventions to help people engaging in this behavior can save a life and help get them treatment.

Non-suicidal self-injury (NSSI), also referred to as self-harm, self-mutilation, or cutting, is a "deliberate, self-inflicted injury without suicidal intent or for socially sanction purposes (such as tattoos or piercings). NSSI is most often associated with 'cutting,' but means of self-harm often also include scratching, punching, punching oneself, banging objects with the intention of injury, biting, tearing of the skin, or burning. The location of the injury may also be an indicator of the severity of the psychological disturbance. Injuries to the face, eye, jugular, or genitals may be more concerning. Although not a suicide attempt, NSSI is associated with suicide and can result in an accidental fatality (Whitlock, 2010).

The average age of the first NSSI is between 11 and 15 years old. The prevalence of at least one incident NSSI is estimated to be 12-37% in high school populations and 12 to 20% in late adulthood and early adulthood cohorts, with 6-7% of adolescents reported repetitive NSSI in the last year. Of those reporting repetitive incidents, 40% reported stopping the behavior within a year of starting, and the vast majority (79.8%) stopped within five years (Whitlock, 2010).

While we might presume that NSSI behavior is associated with mental illness, like depression and anxiety, that is not always the case. Forty-four percent of people that engage in common NSSI do not have any co-morbidity. This type of NSSI includes self-injurious behaviors that are (1) compulsive or ritualistic (like trichotillomania), (2) episodic or occasional, with no identification as a person that self-harms, (3) repetitive with a self-harming identity. Common NSSI can be mild, moderate, or severe, depending on the severity of the injuries (Whitlock, 2010).

The reasons for NSSI are psychological, social, and biological and often step from a history of childhood adversity, comorbid psychological disorders, and emotional dysregulation. The psychological reasons are the most common and involve reducing psychological pain, expressing distress, and distracting oneself from other negative stimuli. Fewer teens report social reasons for NSSI, such as seeking attention or copying peers. Social factors, like peer

reinforcement of the behavior, can increase the likelihood of repetitive NSSI. Those reporting "getting a rush" or "feeling normal" from NSSI may have biological reasons for the behavior. These individuals may have chronically low levels of certain neurotransmitters in their brains. The neurochemical response to injury may bring these neurotransmitter levels to a more normal level and help them regulate emotions. This may be the reason that some people are dependent on NSSI (Whitlock, 2010).

The correlation between NSSI and suicide-related behaviors is well known, but the nature of that relationship is rather paradoxical. Moving from NSSI to suicide-related behaviors may appear to be a predictable progression in severity—without intervention, those engaged in NSSI may get worse and eventually become suicidal. However, experts agree that NSSI may actually help alleviate the distress that could lead to suicide-related behavior, at least temporarily. NSSI could be a tool for coping with distress and avoid suicide (Whitlock, 2010).

In 2017, suicide was the second leading cause of death for people aged 10-19. After a stable period from 2000 to 2007, suicide death rates for teens are now increasing. Distressing thoughts about killing oneself become most common at about age 15 (Berger, 2019) and can lead to a variety of suicide-related behaviors.

Suicide-related behaviors include the following:

- **Suicide:** Death caused by self-directed injurious behavior with any intent to die.
- **Suicide attempt:** A non-fatal self-directed potentially injurious behavior with any intent to die as a result of the behavior. A suicide attempt may or may not result in injury.
- **Suicidal ideation:** Thinking about, considering, or planning for suicide.

Suicide-related behavior is complicated and rarely the result of a single source of trauma or stress. Youth who are at increased risk for suicide-related behavior are dealing with a complex interaction

of multiple relationships (peer, family, or romantic), mental health, and school stressors. Often, people who engage in suicide-related behavior experience overwhelming feelings of helplessness and hopelessness. Involvement with bullying behavior is one stressor that may significantly contribute to feelings of helplessness and hopelessness that raise the risk of suicide.

Youth are at higher risk for suicide-related behaviors if they experienced violence, including child abuse, bullying, or sexual violence, and cannot cope with problems in healthy ways and solve problems peacefully. Teens with disabilities, learning differences, sexual/gender identity differences, or cultural differences are often most vulnerable to being bullied. Teens who report frequently bullying others are at high, long-term risk for suicide-related behavior. Youth who report both being bullied and bullying others (sometimes referred to as bully-victims) have the highest rates of negative mental health outcomes, including depression, anxiety, and thinking about suicide.

The behaviors listed below may be signs that someone is thinking about suicide.

- Talking about wanting to kill themselves or making a plan to kill themselves
- Talking about feeling empty, hopeless, or having no reason to live
- Talking about great guilt or shame
- Talking about feeling trapped or feeling that there are no solutions
- Feeling unbearable pain (emotional pain or physical pain)
- Talking about being a burden to others
- Using alcohol or drugs more often
- Acting anxious or agitated
- Withdrawing from family and friends
- Changing eating and/or sleeping habits
- Showing rage or talking about seeking revenge
- Taking great risks that could lead to death, such as driving

extremely fast
- Talking or thinking about death often
- Displaying extreme mood swings, suddenly changing from very sad to very calm/happy
- Giving away important possessions
- Saying goodbye to friends and family
- Putting affairs in order, making a will

If these warning signs apply to you or someone you know, get help as soon as possible, particularly if the behavior is new or has increased recently. Call the National Suicide Prevention Lifeline (Lifeline) at 1-800-273-TALK (8255), or text the Crisis Text Line (text HELLO to 741741). Both services are free and available 24 hours a day, seven days a week. The following recommendations are five action steps to help someone in emotional pain:

- ASK: "Are you thinking about killing yourself?" It's not an easy question, but studies show that asking at-risk individuals if they are suicidal does not increase suicides or suicidal thoughts.
- KEEP THEM SAFE: Reducing a suicidal person's access to highly lethal items or places is an important part of suicide prevention. While this is not always easy, asking if the at-risk person has a plan and removing or disabling the lethal means can make a difference.
- BE THERE: Listen carefully and learn what the individual is thinking and feeling. Research suggests acknowledging and talking about suicide may reduce rather than increase suicidal thoughts.
- HELP THEM CONNECT: Save the National Suicide Prevention Lifeline's (1-800-273-TALK (8255)) and the Crisis Text Line's number (741741) in your phone, so it's there when you need it. You can also help make a connection with a trusted individual like a family member, friend, spiritual advisor, or mental health professional.

- STAY CONNECTED: Staying in touch after a crisis or after being discharged from care can make a difference. Studies have shown the number of suicide deaths goes down when someone follows up with the at-risk person.

Figure 3. Five action steps for helping someone in emotional pain.

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Moral Development

Theories of Moral Development

The founder of psychoanalysis, Freud (1962), proposed the existence of a tension between the needs of society and the individual. According to Freud, moral development proceeds when the individual's selfish desires are repressed and replaced by the values of important socializing agents in one's life (for instance, one's parents). A proponent of behaviorism, Skinner (1972) similarly focused on socialization as the primary force behind moral development. In contrast to Freud's notion of a struggle between internal and external forces, Skinner focused on the power of external forces (reinforcement contingencies) to shape an individual's development. While both Freud and Skinner focused on the external forces that bear on morality (parents in the case of Freud, and behavioral contingencies in the case of Skinner), Piaget (1965) focused on the individual's construction, construal, and interpretation of morality from a social-cognitive and social-emotional perspective.

Kohlberg (1963) expanded upon Piagetian notions of moral development. While they both viewed moral development as a result of a deliberate attempt to increase the coordination and integration of one's orientation to the world, Kohlberg provided a systematic 3-level, 6-stage sequence reflecting changes in moral judgment throughout the lifespan. Specifically, Kohlberg argued that development proceeds from a selfish desire to avoid punishment (personal), to a concern for group functioning (societal), to a concern for the consistent application of universal ethical principles (moral).

Turiel (1983) argued for a social domain approach to social cognition, delineating how individuals differentiate moral (fairness,

equality, justice), societal (conventions, group functioning, traditions), and psychological (personal, individual prerogative) concepts from early in development throughout the lifespan. Over the past 40 years, research findings have supported this model, demonstrating how children, adolescents, and adults differentiate moral rules from conventional rules, identify the personal domain as a nonregulated domain, and evaluate multifaceted (or complex) situations that involve more than one domain.

For the past 20 years, researchers have expanded the field of moral development, applying moral judgment, reasoning, and emotion attribution to topics such as prejudice, aggression, theory of mind, emotions, empathy, peer relationships, and parent-child interactions.

Piaget's Theory of Moral Development

To understand adult morality, Piaget believed that it was necessary to study both how morality manifests in the child's world as well as the factors that contribute to the emergence of central moral concepts such as welfare, justice, and rights. By interviewing children, Piaget (1965) found that young children were focused on authority mandates and that with age, children become autonomous, evaluating actions from a set of independent principles of morality.

He developed two phases of moral development, one common among children and the other common among adults.

Heteronomous Phase

The first is the Heteronomous Phase. This phase, more common among children, is characterized by the idea that rules come from

authority figures in one's life, such as parents, teachers, and God. It also involves the idea that rules are permanent no matter what. Thirdly, this phase of moral development includes the belief that "naughty" behavior must always be punished and that the punishment will be proportional. This absolutism in moral development is seen in children's play from the age of 5, where they exhibit a blind belief in the rules and ideas of right and wrong passed to them by their elders.

Autonomous Phase

The second phase in Piaget's theory of moral development is referred to as the Autonomous Phase. This phase is more common after one has matured and is no longer a child. In this phase, people begin to view the intentions behind actions as more important than their consequences. For instance, if a person who is driving swerves in order to not hit a dog and then knocks over a road sign, adults are likely to be less angry at the person than if he or she had done it on purpose just for fun. Even though the outcome is the same, people are more forgiving because of the good intention of saving the dog. This phase also includes the idea that people have different morals and that morality is not necessarily universal. People in the Autonomous Phase also believe rules may be broken under certain circumstances. For instance, Rosa Parks broke the law by refusing to give up her seat on a bus, which was against the law but something many people consider moral nonetheless. In this phase, people also stop believing in the idea of immanent justice.

Kohlberg's Theory of Moral Development

Psychologist Lawrence Kohlberg (1927–1987) extended upon the

foundation that Piaget built regarding moral and cognitive development. Kohlberg, like Piaget, was interested in moral reasoning. Moral reasoning does not necessarily equate to moral behavior. Holding a particular belief does not mean that our behavior will always be consistent with the belief. To develop this theory, Kohlberg posed moral dilemmas to people of all ages, and then he analyzed their answers to find evidence of their particular stage of moral development. After presenting people with this and various dilemmas, Kohlberg reviewed people's responses and placed them in different stages of moral reasoning. According to Kohlberg, an individual progresses from the capacity for pre-conventional morality (before age 9) to the capacity for conventional morality (early adolescence), and toward attaining post-conventional morality (once formal operational thought is attained), which only a few fully achieve.

Moral Stages According to Kohlberg

Using a stage model similar to Piaget's, Kohlberg proposed three levels, with six stages, of moral development. Individuals experience the stages universally and in sequence as they form beliefs about justice. He named the levels simply preconventional, conventional, and postconventional.

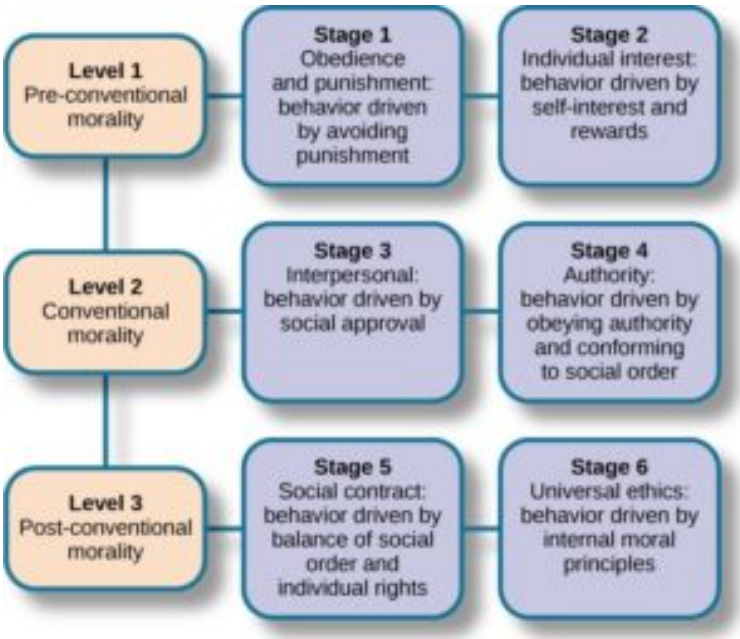

Figure 1. Kohlberg identified three levels of moral reasoning: pre-conventional, conventional, and post-conventional: Each level is associated with increasingly complex stages of moral development.

Preconventional: Obedience and Mutual Advantage

The preconventional level of moral development coincides approximately with the preschool period of life and with Piaget's preoperational period of thinking. At this age, the child is still relatively self-centered and insensitive to the moral effects of actions on others. The result is a somewhat short-sighted orientation to morality. Initially (Kohlberg's Stage 1), the child

adopts **ethics of obedience and punishment**—a sort of "morality of keeping out of trouble." The rightness and wrongness of actions are determined by whether actions are rewarded or punished by authorities, such as parents or teachers. If helping yourself to a cookie brings affectionate smiles from adults, then taking the cookie is considered morally "good." If it brings scolding instead, then it is morally "bad." The child does not think about why an action might be praised or scolded; in fact, says Kohlberg, he would be incapable, at Stage 1, of considering the reasons even if adults offered them.

Eventually, the child learns not only to respond to positive consequences but also learns how to **produce** them by exchanging favors with others. The new ability creates Stage 2, **ethics of market exchange**. At this stage, the morally "good" action is one that favors not only the child but another person directly involved. A "bad" action is one that lacks this reciprocity. If trading the sandwich from your lunch for the cookies in your friend's lunch is mutually agreeable, then the trade is morally good; otherwise, it is not. This perspective introduces a type of fairness into the child's thinking for the first time. However, it still ignores the larger context of actions—the effects on people not present or directly involved. In Stage 2, for example, it would also be considered morally "good" to pay a classmate to do another student's homework—or even to avoid bullying—provided that both parties regard the arrangement as being fair.

Conventional: Conformity to Peers and Society

As children move into the school years, their lives expand to include a larger number and range of peers and (eventually) of the community as a whole. The change leads to **conventional morality**, which are beliefs based on what this larger array of people agree on—hence Kohlberg's use of the term "conventional." At first, in Stage 3, the child's reference group are immediate peers, so Stage

3 is sometimes called the **ethics of peer opinion**. If peers believe, for example, that it is morally good to behave politely with as many people as possible, then the child is likely to agree with the group and to regard politeness as not merely an arbitrary social convention, but a moral "good." This approach to moral belief is a bit more stable than the approach in Stage 2 because the child is taking into account the reactions not just of one other person, but of many. But it can still lead astray if the group settles on beliefs that adults consider morally wrong, like "Shoplifting for candy bars is fun and desirable."

Eventually, as the child becomes a youth and the social world expands, even more, he or she acquires even larger numbers of peers and friends. He or she is, therefore, more likely to encounter disagreements about ethical issues and beliefs. Resolving the complexities lead to Stage 4, the **ethics of law and order**, in which the young person increasingly frames moral beliefs in terms of what the majority of society believes. Now, an action is morally good if it is legal or at least customarily approved by most people, including people whom the youth does not know personally. This attitude leads to an even more stable set of principles than in the previous stage, though it is still not immune from ethical mistakes. A community or society may agree, for example, that people of a certain race should be treated with deliberate disrespect, or that a factory owner is entitled to dump wastewater into a commonly shared lake or river. To develop ethical principles that reliably avoid mistakes like these require further stages of moral development.

Postconventional: Social Contract and Universal Principles

As a person becomes able to think abstractly (or "formally," in Piaget's sense), ethical beliefs shift from acceptance of what the community **does** believe to the **process** by which community beliefs

are formed. The new focus constitutes Stage 5, the **ethics of social contract**. Now an action, belief, or practice is morally good if it has been created through fair, democratic processes that respect the rights of the people affected. Consider, for example, the laws in some areas that require motorcyclists to wear helmets. In what sense are the laws about this behavior ethical? Was it created by consulting with and gaining the consent of the relevant people? Were cyclists consulted, and did they give consent? Or how about doctors or the cyclists' families? Reasonable, thoughtful individuals disagree about how thoroughly and fairly these **consultation** processes should be. In focusing on the processes by which the law was created; however, individuals are thinking according to Stage 5, the ethics of social contract, regardless of the position they take about wearing helmets. In this sense, beliefs on both sides of a debate about an issue can sometimes be morally sound, even if they contradict each other.

Paying attention to due process certainly seems like it should help to avoid mindless conformity to conventional moral beliefs. As an ethical strategy, though, it too can sometimes fail. The problem is that an ethics of social contract places more faith in the democratic process than the process sometimes deserves, and does not pay enough attention to the content of what gets decided. In principle (and occasionally in practice), a society could decide democratically to kill off every member of a racial minority, but would deciding this by due process make it ethical? The realization that ethical means can sometimes serve unethical ends leads some individuals toward Stage 6, the **ethics of self-chosen, universal principles**. At this final stage, the morally good action is based on personally held principles that apply both to the person's immediate life as well as to the larger community and society. The universal principles may include a belief in democratic due process (Stage 5 ethics), but also other principles, such as a belief in the dignity of all human life or the sacredness of the natural environment. At Stage 6, the universal principles will guide a person's beliefs even if the principles mean

occasionally disagreeing with what is customary (Stage 4) or even with what is legal (Stage 5).

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Video 1. *Kohlberg's Six Stages of Moral Development* explains the stages of moral reasoning and applies it to an example scenario.

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Kohlberg and the Heinz Dilemma

The Heinz dilemma is a frequently used example to help us understand Kohlberg's stages of moral development. How would you answer this dilemma? Kohlberg was not interested in whether you answer yes or no to the dilemma: Instead, he was interested in the reasoning behind your answer.

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was

a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1,000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said: "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. Should the husband have done that? (Kohlberg, 1969, p. 379)

From a theoretical point of view, it is not important what the participant thinks that Heinz should do. Kohlberg's theory holds that the justification the participant offers is what is significant, the form of their response. Below are some of many examples of possible arguments that belong to the six stages:

- Stage one (obedience): Heinz should not steal the medicine because he will consequently be put in prison, which will mean he is a bad person. OR Heinz should steal the medicine because it is only worth $200 and not how much the druggist wanted for it; Heinz had even offered to pay for it and was not stealing anything else.
- Stage two (self-interest): Heinz should steal the medicine because he will be much happier if he saves his wife, even if he will have to serve a prison sentence. OR Heinz should not steal the medicine because prison is an awful place, and he would more likely languish in a jail cell than over his wife's death.
- Stage three (conformity): Heinz should steal the medicine because his wife expects it; he wants to be a good husband. OR Heinz should not steal the drug because stealing is bad, and he is not a criminal; he has tried to do everything he can without breaking the law, you cannot blame him.
- Stage four (law-and-order): Heinz should not steal the medicine because the law prohibits stealing, making it illegal.

OR Heinz should steal the drug for his wife but also take the prescribed punishment for the crime as well as paying the druggist what he is owed. Criminals cannot just run around without regard for the law; actions have consequences.

- Stage five (social contract orientation): Heinz should steal the medicine because everyone has a right to choose life, regardless of the law. OR Heinz should not steal the medicine because the scientist has a right to fair compensation. Even if his wife is sick, it does not make his actions right.
- Stage six (universal human ethics): Heinz should steal the medicine because saving a human life is a more fundamental value than the property rights of another person. OR Heinz should not steal the medicine because others may need medicine just as badly, and their lives are equally significant.

Think It Over

Consider your decision-making processes. What guides your decisions? Are you primarily concerned with your personal well-being? Do you make choices based on what other people will think about your decision? Or are you guided by other principles? To what extent is this approach guided by your culture?

Kohlberg continued to explore his theory after he published his research. He postulated that there could be other stages and that there could be transitions into each stage. One thing that Kohlberg never fully addressed was his use of nearly all-male samples. Men and women tend to have very different styles of moral decision-making; men tend to be very justice-oriented, while women tend to be more compassion-oriented. In terms of Kohlberg's stages,

women tend to be in lower stages than men because of their compassion orientation.

Carol Gilligan was one of Kohlberg's research assistants. She believed that Kohlberg's theory was inherently biased against women. Gilligan suggests that the biggest reason that there is a gender bias in Kohlberg's theory is that males tend to focus on logic and rules. In contrast, women focus on caring for others and relationships. She suggests, then, that in order to truly measure women's moral development, it was necessary to create a measure specifically for women. Gilligan was clear that she did not believe neither male nor female moral development was better, but rather that they were equally important.

Gilligan's Morality of Care

As logical as they sound, Kohlberg's stages of moral justice are not sufficient for understanding the development of moral beliefs. To see why, suppose that you have a student who asks for an extension of the deadline for an assignment. The justice orientation of Kohlberg's theory would prompt you to consider issues of whether granting the request is fair. Would the late student be able to put more effort into the assignment than other students? Would the extension place a difficult demand on you, since you would have less time to mark the assignments? These are important considerations related to the rights of the students and the teacher. In addition to these, however, are considerations having to do with the responsibilities that you and the requesting student have for each other and others. Does the student have a valid personal reason (illness, death in the family, etc.) for the assignment being late? Will the assignment lose its educational value if the student has to turn it in prematurely? These latter questions have less to do with fairness and rights and more to do with taking care of and responsibility for

students. They require a framework different from Kohlberg's to be understood fully.

One such framework has been developed by Carol Gilligan, whose ideas center on **morality of care**, or system of beliefs about human responsibilities, care, and consideration for others. Gilligan proposed three moral positions that represent different extents or breadth of ethical care. Unlike Kohlberg or Piaget, she does not claim that the positions form a strictly developmental sequence, but only that they can be ranked hierarchically according to their depth or subtlety. In this respect, her theory is "semi-developmental" in a way similar to Maslow's theory of motivation (Brown & Gilligan, 1992; Taylor, Gilligan, & Sullivan, 1995). Table 9.1 summarizes the three moral positions from Gilligan's theory.

Table 1. Positions of moral development according to Gilligan

Moral position	Definition of what is morally good
Position 1: Survival orientation	Action that considers one's personal needs only
Position 2: Conventional care	Action that considers others' needs or preferences, but not one's own
Position 3: Integrated care	Action that attempts to coordinate one's own personal needs with those of others

Position 1: Caring as Survival

The most basic kind of caring is a **survival orientation**, in which a person is concerned primarily with his or her welfare. If a teenage girl with this ethical position is wondering whether to get an abortion, for example, she will be concerned entirely with the effects of the abortion on herself. The morally good choice will be whatever creates the least stress for herself, and that disrupts her own life the least. Responsibilities to others (the baby, the father, or her family) play little or no part in her thinking.

As a moral position, a survival orientation is obviously not satisfactory for classrooms on a widespread scale. If every student only looked out for himself or herself, classroom life might become rather unpleasant! Nonetheless, there are situations in which focusing primarily on yourself is both a sign of good mental health and relevant to teachers. For a child who has been bullied at school or sexually abused at home, for example, it is both healthy and morally desirable to speak out about how bullying or abuse has affected the victim. Doing so means essentially looking out for the victim's own needs at the expense of others' needs, including the bully's or abuser's. Speaking out, in this case, requires a survival orientation and is healthy because the child is taking care of herself.

Position 2: Conventional Caring

A more subtle moral position is **caring for others**, in which a person is concerned about others' happiness and welfare, and about reconciling or integrating others' needs where they conflict with each other. In considering an abortion, for example, the teenager at this position would think primarily about what other people prefer. Do the father, her parents, and/or her doctor want her to keep the child? The morally good choice becomes whatever will please others the best. This position is more demanding than Position 1, ethically, and intellectually, because it requires coordinating several persons' needs and values. Nevertheless, it is often morally insufficient because it ignores one crucial person: the self.

In classrooms, students who operate from Position 2 can be very desirable in some ways; they can be eager to please, considerate, and good at fitting in and at working cooperatively with others. Because these qualities are usually welcome in a busy classroom, teachers can be tempted to reward students for developing and using them. The problem with rewarding Position 2 ethics, however, is that doing so neglects the student's development—his or her own

academic and personal goals or values. Sooner or later, personal goals, values, and identity need attention and care, and educators have a responsibility for assisting students in discovering and clarifying them.

Position 3: Integrated Caring

The most developed form of moral caring in Gilligan's model is **integrated caring**, the coordination of personal needs and values with those of others. Now the morally good choice takes account of everyone, *including* yourself, not everyone *except* yourself. In considering an abortion, a woman at Position 3 would think not only about the consequences for the father, the unborn child, and her family but also about the consequences for herself. How would bearing a child affect her own needs, values, and plans? This perspective leads to moral beliefs that are more comprehensive but ironically are also more prone to dilemmas because the widest possible range of individuals is being considered.

In classrooms, integrated caring is most likely to surface whenever teachers give students wide, sustained freedom to make choices. If students have little flexibility in their actions, there is little room for considering *anyone*'s needs or values, whether their own or others'. If the teacher says simply: "Do the homework on page 50 and turn it in tomorrow morning," then the main issue becomes compliance, not a moral choice. Suppose instead that she says something like this: "Over the next two months, figure out an inquiry project about the use of water resources in our town. Organize it any way you want—talk to people, read widely about it, and share it with the class in a way that all of us, including yourself, will find meaningful." An assignment like this poses moral challenges that are not only educational but also moral since it requires students to make value judgments. Why? For one thing, students must decide what aspect of the topic matters to them.

Such a decision is partly a matter of personal values. For another thing, students have to consider how to make the topic meaningful or important to *others* in the class. Third, because the timeline for completion is relatively far in the future, students may have to weigh personal priorities (like spending time with friends or family) against educational priorities (working on the assignment a bit more on the weekend). As you might suspect, some students might have trouble making good choices when given this sort of freedom—and their teachers might, therefore, be cautious about giving such an assignment. Nevertheless, the difficulties in making choices are part of Gilligan's point: integrated caring is indeed more demanding than caring based only on survival or on consideration of others. Not all students may be ready for it.

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Video 2. *Carol Gilligan's Theory of Moral Development* explains the difference in moral development from the care perspective that females often take in society.

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The Development of Moral Reasoning

The Foundations of Moral Reasoning in Infancy

The work of Lawrence Kohlberg was an important start to modern research on moral development and reasoning. However, Kohlberg relied on a specific method: he presented moral dilemmas and asked children and adults to explain what they would do and—more importantly—why they would act in that particular way. Kohlberg found that children tended to make choices based on avoiding punishment and gaining praise. But children are at a disadvantage compared to adults when they must rely on language to convey their inner thoughts and emotional reactions, so what they say may not adequately capture the complexity of their thinking.

Starting in the 1980s, developmental psychologists created new methods for studying the thought processes of children and infants long before they acquire language. One particularly effective method is to present children with puppet shows to grab their attention and then record nonverbal behaviors, such as looking and choosing, to identify children's preferences or interests.

A research group at Yale University has been using the puppet show technique to study the moral thinking of children for much of the past decade. What they have discovered has given us a glimpse of surprisingly complex thought processes that may serve as the foundation of moral reasoning.

EXPERIMENT 1: Do children prefer givers or takers?

In 2011, J. Kiley Hamlin and Karen Wynn put on puppet shows for very young children: 5-month-old infants. The infants watch a puppet bouncing a ball. We'll call this puppet the "bouncer puppet." Two other puppets stand at the back of the stage, one to left and the other to the right. After a few bounces, the ball gets away from the bouncer puppet and rolls to the side of the stage toward one of the other puppets. This puppet grabs the ball. The bouncer puppet turns toward the ball and opens its arms as if asking for the ball back.

This is where the puppet show gets interesting (for a young infant, anyway!). Sometimes, the puppet with the ball rolls it back to the bouncer puppet. This is the "giver puppet" condition. Other times, the infant sees a different ending. As the bouncer puppet opens its arms to ask for the ball, the puppet with the ball turns and runs away with it. This is the "taker puppet" condition. Although the giver and taker puppets are two copies of the same animal doll, they are easily distinguished because they are wearing different colored shirts, and color is a quality that infants easily distinguish and remember. It looks like this:

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Video 3. *Experiment 1 Demonstration.*

Each infant sees both conditions: the giver condition and the

taker condition. Just after the end of the second puppet show (i.e., the second condition), a new researcher, who doesn't know which puppet was the giver and which was the taker, sits in front of the infant with the giver puppet in one hand and the taker puppet in the other. The 5-month-old infants are allowed to reach for a puppet. The one the child reaches out to touch is considered the preferred puppet. The children preferred the giver puppet.

But this isn't the end of the story…

EXPERIMENT 2: Do infants judge others based on their behavior?

Dr. Hamlin and her colleagues wondered if infants might consider more factors than nice or hurtful when making a judgment. Adults generally prefer situations where good things happen to someone rather than something harmful. However, when adults see someone do something bad, they may find satisfaction in seeing that person punished by having something bad happen to him or her. In a nutshell: good things should happen to good people and bad things should happen to bad people. This is what is called "just world" thinking, where people get what they deserve.

In th\is second study, Hamlin's team tested 8-month-old infants and repeated the procedures from Experiment 1 with a major addition. First, they saw the bouncer puppet either helping or hindering another puppet–setting the conditions for the bouncer puppet to be seen as good or bad. Then, they watched the same ball-bouncing puppet show. Here is what happened:

- Puppet Show #1: A puppet is trying to open a box, but cannot quite succeed. Two puppets stand in the background. For some infants, as the first puppet struggles to open the box, one of the puppets in the back comes forward and helps to open the box. This is the helper puppet. For other children, as the first

puppet struggles, a puppet comes from the back and jumps on the box, slamming it shut. This is the hinderer puppet. Each infant sees only a helper or a hinderer—not both. Here is a video showing the helper puppet situation:

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Video 4. *Experiment 2 Demonstration.*

- Puppet Show #2: Just after the infants have watched the first show, the second puppet show begins. This is the show that you read about in Experiment 1. The only thing that is new is that the bouncer puppet, the one that loses the ball, is either the helper puppet from Puppet Show #1 or the hinderer puppet from Puppet Show #1. Each infant sees this puppet lose the ball to a giver, who returns the ball, and to a taker, who runs off with the ball.

This video demonstrates show #2. The elephant in the yellow shirt from the first show is now bouncing a ball. After dropping the ball, the moose in the green shirt gives it back to him, while the moose in the red shirt takes it away.

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here:
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Video 5. *Experiment 2 Demonstration.*

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=112#video-112-4

Video 6. *Experiment 2 Demonstration.*

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So far we have concluded that even young babies prefer the "nice" puppet and show a preference for a puppet who helps another puppet. But this only happened when the bouncer puppet was the helper from the first puppet show. What if, instead of the nice elephant in the yellow shirt bouncing the ball, the elephant in the red shirt (the one who jumped on the duck's box, remember?)

was the one bouncing the ball? Imagine the same scenario: the mean elephant in the red shirt is bouncing the ball, he drops it, and the moose in the green shirt gives it to him or the moose in the red shirt takes it away.

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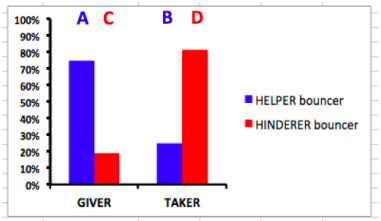
So now things are getting interesting, right? Do 8-month old infants understand the concepts of revenge or justice? We must always be careful when labeling behaviors of children (or animals) with characteristics we use for human adults. In the description above, we have talked of "nice puppets" and "mean puppets" and used other loaded terms. It is tempting to interpret the choices of the 8-month-olds as a kind of revenge motive: the bad guy gets its just desserts (the hinderer puppet has its ball stolen) and the good guy gets its just reward (the helper puppet is itself helped by the giver). Maybe that is what is going on, but we encourage you to consider



	GIVER	TAKER	TOTAL
HELPER bouncer	75%	25%	100%
HINDERER bouncer	19%	81%	100%

Figure 2. *This bar graph shows the results of Experiment 2 for 8-month-old infants. The blue bars show the preferences for the infants who saw the helper from the first show as the bouncer in the second. Bar A is taller than Bar B, showing the greater choice of the giver than the taker puppet. The red bars show the reverse effect. The babies strongly preferred the taker (Bar C) to the giver (Bar D) when the puppet bouncing the ball had been the hinderer, who jumped on the box in the first show.*

these very sophisticated types of thinking as merely one hypothesis. Remember the facts—what did the puppets do and what choices did the infants make?—without committing yourself to the adult-level interpretation.

The researchers believe that this type of thinking, which is remarkably sophisticated, takes some cognitive development. They tested 5-month-olds using the same procedures, and the results with these younger infants were different. The 5-month-olds showed an overwhelming preference for the giver puppets, regardless of who was bouncing the ball. Maybe it is too complex for them to understand that the bouncer puppet in the second show was the same puppet from the first show. Or perhaps their memory processes are too fragile to hold onto information for that length of time. Maybe the revenge motive is too advanced. Or maybe something else is going on. What is clear is that 5-month-olds and 8-month-olds respond differently to the situations tested in the second experiment.

CONCLUSIONS

This exercise started with a reminder that Lawrence Kohlberg found that children went through a long developmental process in their moral reasoning. Based on children's reasoning aloud about moral dilemmas, Kohlberg concluded that children younger than about 8 or 9 years of age make moral decisions based on avoiding punishment and receiving praise. Neither his research nor that of most others in the 1970s and 1980s suggested that young children would use multiple sources of information and judgments about the meaning of behaviors in their thinking about what sorts of behaviors are better or worse.

If Dr. Hamlin and her colleagues are right, then infants are much more sophisticated and complex in their thinking about the world than these earlier researchers thought. In Dr. Hamlin's view, infants

like good things to happen to good puppets and people, and bad things to happen to bad puppets and people. Experiment 3 suggests that they make judgments about more than helping and harming behavior. They prefer others who are like them (green beans vs. graham crackers) and they don't mind if others who are not like them have unpleasant experiences.

The research we have been reviewing is just part of an impressive set of research on infant thinking. The ideas that the researchers have developed are intriguing and they are consistent with the modern view of the infant as an active, creative thinker. At the same time, remember that science doesn't rest on an early set of explanations based on a small set of complicated experiments. Science pushes beyond what we currently know and believe. This starts with curiosity on your part. Are the experimenters correct in interpreting reaching behavior as showing a preference or is something else going on? Do infants really prefer prosocial behaviors to antisocial behaviors, or is there some other explanation for their preferences? How else could we test the moral judgments of infants without using puppet shows? The next generation of creative scientists will push beyond what we know now, with new research methods and new ideas about the mind.

We'll give Dr. Hamlin the last word. Here is part of her conclusion section from an article that summarizes some of the research we have been studying: "In sum, recent developmental research supports the claim that at least some aspects of human morality are innate…Indeed, these early tendencies are far from shallow, mechanical predispositions to behave well or knee-jerk reactions to particular states of the world. Infant moral inclinations are sophisticated, flexible, and surprisingly consistent with adults' moral inclinations, incorporating aspects of moral goodness, evaluation, and retaliation." (Hamlin, 2013, p. 191)

Moral Reasoning in Childhood

Conscience consists of the cognitive, emotional, and social influences that cause young children to create and act consistently with internal standards of conduct (Kochanska, 2002). It emerges from young children's experiences with parents, particularly in the development of a mutually responsive relationship that motivates young children to respond constructively to the parents' requests and expectations. Biologically based temperament is involved, as some children are temperamentally more capable of motivated self-regulation (a quality called effortful control) than are others, while some children are more prone to the fear and anxiety that parental disapproval can evoke. The development of conscience is influenced by having a good fit between the child's temperamental qualities and how parents communicate and reinforce behavioral expectations.

Conscience development also expands as young children begin to represent moral values and think of themselves as moral beings. By the end of the preschool years, for example, young children develop a "moral self" by which they think of themselves as people who want to do the right thing, who feel badly after misbehaving, and who feel uncomfortable when others misbehave. In the development of conscience, young children become more socially and emotionally competent in a manner that provides a foundation for later moral conduct (Thompson, 2012).

Moral Reasoning in Adolescence

As adolescents become increasingly independent, they also develop more nuanced thinking about morality, or what is right or wrong. As adolescents' cognitive, emotional, and social development continue to mature, their understanding of morality expands, and their

behavior becomes more closely aligned with their values and beliefs. Therefore, moral development describes the evolution of these guiding principles and is demonstrated by the ability to apply these guidelines in daily life. Understanding moral development is important in this stage, where individuals make so many important decisions and gain more and more legal responsibility.

Adolescents are receptive to their culture, to the models they see at home, in school, and in the mass media. These observations influence moral reasoning and moral behavior. When children are younger, their family, culture, and religion greatly influence their moral decision-making. During the early adolescent period, peers have a much greater influence. Peer pressure can exert a powerful influence because friends play a more significant role in teens' lives.

Furthermore, the new ability to think abstractly enables youth to recognize that rules are simply created by other people. As a result, teens begin to question the absolute authority of parents, schools, government, and other traditional institutions (Vera-Estay, Dooley, & Beauchamp, 2014). By late adolescence, most teens are less rebellious as they have begun to establish their own identity, their own belief system, and their place in the world.

Unfortunately, some adolescents have life experiences that may interfere with their moral development. Traumatic experiences may cause them to view the world as unjust and unfair. Additionally, social learning also impacts moral development. Adolescents may have observed the adults in their lives, making immoral decisions that disregarded the rights and welfare of others, leading these youth to develop beliefs and values that are contrary to the rest of society. That being said, adults have opportunities to support moral development by modeling the moral character that we want to see in our children. Parents are particularly important because they are generally the original source of moral guidance. Authoritative parenting facilitates children's moral growth better than other parenting styles, and one of the most influential things a parent can do is to encourage the right kind of peer relations (McDevitt & Ormrod, 2004). While parents may find this process of moral

development difficult or challenging, it is important to remember that this developmental step is essential to their children's well-being and ultimate success in life.

As mentioned previously, Lawrence Kohlberg (1984) argued that moral development moves through a series of stages, and reasoning about morality becomes increasingly complex (somewhat in line with increasing cognitive skills, as per Piaget's stages of cognitive development). In early adolescence, young people begin to care about how situational outcomes impact others and want to please and be accepted (conventional morality). At this developmental phase, people are able to value the good that can be derived from holding to social norms in the form of laws or less formalized rules. From adolescence and beyond, adolescents begin to employ abstract reasoning to justify behaviors. Moral behavior is based on self-chosen ethical principles that are generally comprehensive and universal, such as justice, dignity, and equality, which is postconventional morality.

Influences on Moral Development

Like most aspects of development, influencing factors are multifaceted. Moral development is strongly influenced by interpersonal factors, such as family, peers, and culture. Intrapersonal factors also impact moral development, such as cognitive changes, emotions, and even neurodevelopment.

Interpersonal Influences

Children's interactions with caregivers and peers have been shown to influence their development of moral understanding and behavior. Researchers have addressed the influence of interpersonal

interactions on children's moral development from two primary perspectives: socialization/internalization (Grusec & Goodnow, 1994; Kochanska & Askan, 1995; Kochanska, Askan, & Koenig, 1995) and social domain theory (Turiel, 1983; Smetana 2006). Research from the social domain theory perspective focuses on how children actively distinguish moral from conventional behavior based in part based on the responses of parents, teachers, and peers (Smetana, 1997). Adults tend to respond to children's moral transgressions (e.g., hitting or stealing) by drawing the child's attention to the effect of his or her action on others and doing so consistently across various contexts.

In contrast, adults are more likely to respond to children's conventional misdeeds (e.g., wearing a hat in the classroom, eating spaghetti with fingers) by reminding children about specific rules and doing so only in certain contexts (e.g., at school but not at home) (Smetana, 1984; 1985). Peers respond mainly to moral but not conventional transgressions and demonstrate emotional distress (e.g., crying or yelling) when they are the victim of moral but not conventional transgressions (Smetana, 1984). Children then use these different cues to help determine whether behaviors are morally or conventionally wrong.

Research from a socialization/internalization perspective focuses on how adults pass down standards of behavior to children through parenting techniques and why children do or do not internalize those values (Grusec & Goodnow, 1994; Kochanska & Askan, 1995). From this perspective, moral development involves children's increasing compliance with and internalization of adult rules, requests, and standards of behavior. Using these definitions, researchers find that parenting behaviors vary in the extent to which they encourage children's internalization of values and that these effects depend partially on child attributes, such as age and temperament (Grusec & Goodnow, 1994). For instance, Kochanska (1997) showed that gentle parental discipline best promotes conscience development in temperamentally fearful children. However, the same parental responsiveness and a mutually

responsive parent-child orientation best promote conscience development in temperamentally fearless children. These parental influences exert their effects through multiple pathways, including increasing children's experience of moral emotions (e.g., guilt, empathy) and their self-identification as moral individuals (Kochanska, 2010).

Moral Development in the Family

In the formation of children's morals, no outside influence is greater than that of the family. Through punishment, reinforcement, and both direct and indirect teaching, families instill morals in children and help them to develop beliefs that reflect the values of their culture. Although families' contributions to children's moral development are broad, there are particular ways in which morals are most effectively conveyed and learned.

Justice

Families establish rules for right and wrong behavior, which are maintained through positive reinforcement and punishment. Positive reinforcement is the reward for good behavior and helps children learn that certain actions are encouraged above others. Punishment, by contrast, helps to deter children from engaging in bad behaviors, and from an early age helps children to understand that actions have consequences. This system additionally helps children to make decisions about how to act, as they begin to consider the outcomes of their behavior.

Fairness

The notion of what is fair is one of the central moral lessons that children learn in the family context. Families set boundaries on the distribution of resources, such as food and living spaces, and allow members different privileges based on age, gender, and employment. The way in which a family determines what is fair affects children's development of ideas about rights and entitlements, and also influences their notions of sharing, reciprocity, and respect.

Personal Balance

Through understanding principles of fairness, justice, and social responsibilities, children learn to find a balance between their own needs and wants and the interests of the greater social environment. By placing limits on their desires, children benefit from a greater sense of love, security, and shared identity. At the same time, this connectedness helps children to refine their own moral system by providing them with a reference for understanding right and wrong.

Social Roles

In the family environment, children come to consider their actions not only in terms of justice but also in terms of emotional needs. Children learn the value of social support from their families and develop motivations based on kindness, generosity, and empathy, rather than on only personal needs and desires. By learning to care for the interests and well-being of their family, children develop concern for society as a whole.

Morality and Culture

The role of culture on moral development is an important topic that raises fundamental questions about what is universal and what is culturally specific regarding morality and moral development. Many research traditions have examined this question, with social-cognitive and structural-developmental positions theorizing that morality has a universal requirement to it, drawing from moral philosophy. The expectation is that if morality exists, it has to do with those values that are generalizable across groups and cultures. Alternatively, relativistic cultural positions have been put forth mostly by socialization theories that focus on how cultures transmit values rather than what values are applied across groups and individuals.

As an example of some of the debates, Shweder, Mahapatra, and Miller (1987) argued for moral relativism or the notion that different cultures defined the boundaries of morality differently. In contrast, Turiel and Perkins (2004) argued for the universality of morality, focusing largely on evidence throughout the history of resistance movements that fight for justice through the affirmation of individual self-determination rights. In an update on the debate between moral relativism and moral universality, Miller (2006) provides a thoughtful review of the cultural variability of moral priorities. Miller argues that rather than variability in what individuals consider moral (fairness, justice, rights), there is cultural variability in the priority given to moral considerations (e.g., the importance of prosocial helping). Wainryb (2006), in contrast, reviews extensive literature that has demonstrated that children in diverse cultures such as the U.S., India, China, Turkey, and Brazil share a pervasive view about upholding fairness and the wrongfulness of inflicting harm on others. Cultures vary in terms of conventions and customs, but not principles of fairness, which appear to emerge very early in development, before socialization influences. Wainryb (1991; 1993) shows that many apparent cultural

differences in moral judgments are actually due to different informational assumptions or beliefs about the way the world works. When people hold different beliefs about the effects of actions or the status of different groups of people, their judgments about the harmfulness or fairness of behaviors often differ, even when they are applying the same moral principles.

Another powerful socializing mechanism by which values are transmitted is religion, which is for many inextricably linked to cultural identity. Nucci and Turiel (1993) assessed individuals' reactions to dictates from God, and the distinctions in their reactions to God's moral (e.g., stealing) and conventional (e.g., day of worship) dictates. One explicit manner in which societies can socialize individuals is through moral education. Solomon and colleagues (1988) present evidence from a study that integrated both direct instruction and guided reflection approaches to moral development, with evidence for resultant increases in spontaneous prosocial behavior. Finally, studies of moral development and cultural issues cover many subtopics. For instance, a recent review of studies examining social exclusion identifies cultural similarities in the evaluation of exclusion across a range of societies and cultures (Hitti, Mulvey & Killen, 2011).

Intrapersonal Influences

Moral questions tend to be emotionally charged issues that evoke strong affective responses. Consequently, emotions likely play an important role in moral development. However, there is currently little consensus among theorists on how emotions influence moral development. Psychoanalytic theory, founded by Freud, emphasizes the role of guilt in repressing primal drives. Research on prosocial behavior has focused on how emotions motivate individuals to engage in moral or altruistic acts. Social-cognitive development theories have recently begun to examine how emotions influence

moral judgments. Intuitionist theorists assert that moral judgments can be reduced to immediate, instinctive emotional responses elicited by moral dilemmas.

Research on socioemotional development and prosocial development has identified several "moral emotions," which are believed to motivate moral behavior and influence moral development (Eisenberg, 2000, for a review). The primary emotions consistently linked with moral development are guilt, shame, empathy, and sympathy. Guilt has been defined as "an agitation-based emotion or painful feeling of regret that is aroused when the actor causes, anticipates causing or is associated with an aversive event" (Fergusen & Stegge, 1998). Shame is often used synonymously with guilt but implies a more passive and dejected response to a perceived wrong. Guilt and shame are considered "self-conscious" emotions because they are of primary importance to an individual's self-evaluation.

In contrast to guilt and shame, empathy and sympathy are considered other-oriented moral emotions. Empathy is commonly defined as an affective response produced by the apprehension or comprehension of another's emotional state, which mirrors the other's affective state. Similarly, sympathy is defined as an emotional response produced by the apprehension or comprehension of another's emotional state, which does not mirror the other's affect but instead causes one to express concern or sorrow for the other (Eisenberg, 2000).

The relation between moral action and moral emotions has been extensively researched. Very young children have been found to express feelings of care, and empathy towards others, showing concerns for other's well-being (Eisenberg, Spinard, & Sadovsky, 2006). Research has consistently demonstrated that when empathy is induced in an individual, he or she is more likely to engage in subsequent prosocial behavior (Batson 1998; Eisenberg, 200 for review). Additionally, other research has examined emotions of shame and guilt concerning children's emphatic and prosocial behavior (Zahn-Waxler & Robinson, 1995).

While emotions serve as information for children in their interpretations about the moral consequences of acts, the role of emotions in children's moral judgments has only recently been investigated. Some approaches to studying emotions in moral judgments come from the perspective that emotions are automatic intuitions that define morality (Greene, 2001; Haidt, 2001). Other approaches emphasize the role of emotions as evaluative feedback that help children interpret acts and consequences (Turiel & Killen, 2010). Research has shown that children attribute different emotional outcomes to actors involved in moral transgressions than those involved in conventional transgressions (Arsenio, 1988; Arsenio & Fleiss, 1996). Emotions may help individuals prioritize among different information and possibilities and reduce information processing demands in order to narrow the scope of the reasoning process (Lemerise & Arsenio, 2000). In addition, Malti, Gummerum, Keller, and Buchmann (2009), found individual differences in how children attribute emotions to victims and victimizers.

Forming a Sense of Rights and Responsibilities

When it comes to schooling and teaching, moral choices are not restricted to occasional dramatic incidents but are woven into almost every aspect of classroom life. Imagine this simple example. Suppose that you are teaching, reading to a small group of second-graders, and the students are taking turns reading a story out loud. Should you give every student the same amount of time to read, even though some might benefit from having additional time? Or should you give more time to the students who need extra help, even if doing so bores classmates and deprives others of equal shares of "floor time"? Which option is fairer, and which is more considerate? Simple dilemmas like this happen every day at all grade levels simply because students are diverse, and because class time and a teacher's energy are finite.

Embedded in this rather ordinary example are moral themes about fairness or justice, on the one hand, and about consideration or care on the other. It is important to keep both themes in mind

when thinking about how students develop beliefs about right or wrong. A **morality of justice** is about human rights—or, more specifically, about respect for fairness, impartiality, equality, and individuals' independence. A **morality of care**, on the other hand, is about human responsibilities—more specifically, about caring for others, showing consideration for individuals' needs, and interdependence among individuals. Students and teachers need both forms of morality. In the next sections, therefore, we explain a major example of each type of developmental theory, beginning with the morality of justice.

Character Development: Integrating Ethical Understanding, Care, and Action

The theories described so far all offer frameworks for understanding how children grow into youth and adults. Those by Maslow, Kohlberg, and Gilligan are more specific than the one by Erikson in that they focus on the development of understanding about ethics. From a teacher's point of view, though, the theories are all limited in two ways. One problem is that they focus primarily on cognition—on what children *think* about ethical issues—more than on emotions and actions. The other is that they say little about how to encourage ethical development. Encouragement is part of teachers' jobs, and doing it well requires understanding not only what students know about ethics, but also how they feel about it and what ethical actions they are prepared to take.

Many educators have recognized the need for children to be guided in the development of ethics and morals, and a number of them have, therefore, developed practical programs that integrate ethical understanding, care, and action. As a group, the programs are often called **character education**. However, individual programs have a variety of specific names (for example, moral dilemma education, integrative ethical education, social competence

education, and many more). Details of the programs vary, but they all combine a focus on ethical knowledge with attention to ethical feelings and actions (Elkind & Sweet, 2004; Berkowitz & Bier, 2006; Narvaez, 2010). Character education programs go well beyond just teaching students to obey ethical rules, such as "Always tell the whole truth" or "Always do what the teacher tells you to do." Such rules require very little thinking on the part of the student, and there are usually occasions in which a rule that is supposedly universal needs to be modified, "bent," or even disobeyed. (For example, if telling the whole truth might hurt someone's feelings, it might sometimes be more considerate—and thus more ethical—to soften the truth a bit, or even to say nothing at all.)

Instead, character education is about inviting students to think about the broad questions of his or her life, such as "What kind of person should I be?" or "How should I live my life?" Thoughtful answers to such broad questions help to answer a host of more specific questions that have ethical implications. For example, "Should I listen to the teacher right now, even if she is a bit boring, or just tune out?" or "Should I offer to help my friend with the homework she is struggling with, or hold back, so that learns to do it herself?" Most of the time, there is not enough time to reason about questions like these deliberately or consciously. Responses have to become intuitive, automatic, and **embodied** —meaning that they have to be based on fairly immediate emotional responses (Narvaez, 2009). The goal of character education is to develop students' capacities to respond to daily ethical choices not only consciously and cognitively, but also intuitively and emotionally. To the extent that this goal is met, students can indeed live a good, ethically responsible life.

Schoolwide Programs of Character Education

In the most comprehensive approaches to character education, an

entire school commits itself to develop students' ethical character, despite the immense diversity among students (Minow, Schweder, & Markus, 2008). All members of the staff—not just teachers and administrators, but also custodians and educational assistants—focus on developing positive relationships with students. The underlying theme that develops is one of cooperation and mutual care, not competition. Fairness, respect, and honesty pervade class and school activities; discipline, for example, focuses on solving conflicts between students and between students and teachers, rather than on rewarding obedience or punishing wrong-doers. The approach requires significant reliance on democratic meetings and discussions, both in classrooms and wherever else groups work together in school.

Building a Culture of Kindness

Video 7. *Building a Culture of Kindness* with a Day of Services discusses ways that schools are building character education into their programs and the impact it is having on students.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=112#oembed-3

Classroom Programs of Character Education

Even if a teacher is teaching character education simply within her classroom, there are many strategies available. The goal, in this case, is to establish the classroom as a place where everyone feels included, and where everyone treats everyone else with civility and respect. Conflicts and disagreements may still occur, but in a caring community, they can be resolved without undue anger or hostility. Here are a few ways to work toward this sort of classroom:

- Use class meetings to decide on as many important matters as possible—such as the expected rules of behavior, important classroom activities, or ongoing disagreements.
- Try arranging for students to collaborate on significant projects and tasks.
- Arrange a "Buddies" program in which students of different grade levels work together on a significant task. Older students can sometimes assist younger students by reading to them, by listening to them read, or both. If an older student is having trouble with reading himself or herself, furthermore, a reading buddies program can sometimes also be helpful to the older student.
- Familiarize students with conflict resolution strategies and practice using them when needed.
- Many areas of curriculum lend themselves to discussions about ethical issues. Obvious examples are certain novels, short stories, and historical events. However, ethical issues lurk elsewhere as well. Teaching nutrition, for example, can raise issues about the humane treatment of animals that will be slaughtered for food, and about the ethical acceptability of using a large number of grains to feed animals even though many people in the world do not have enough to eat.
- Service learning projects can be very helpful in highlighting issues of social justice. Planning, working at, and reflecting

about a local soup kitchen, tutoring students from low-income families, performing simple repairs on homes in need: projects like these broaden knowledge of society and the needs of its citizens.

Glossary

Ainsworth's strange situation: a sequence of staged episodes that illustrate the type of attachment between a child and (typically) their mother

adverse childhood experiences: abuse, neglect, and violent experiences that contribute to childhood trauma

aggressive-rejected: children who are ostracized because they are aggressive, loud, and confrontational

anal stage: the second stage in Freud's theory of psychosexual development, lasting from age 18 months to three years, during which time the anus is the primary erogenous zone and pleasure is derived from controlling bladder and bowel movements

athletic coach style of parenting: the rules for behavior are consistent and objective and presented in that way. The parent's role is to provide guidance while the child learns firsthand how to handle these situations

attachment: the positive emotional bond that develops between a child and a particular individual

authoritarian parenting: the traditional model of parenting in which parents make the rules and children are expected to be obedient

authoritative parenting: appropriately strict, reasonable, and affectionate. They are willing to negotiate when appropriate

autonomy vs. shame and doubt: Erikson's second crisis of psychosocial development, during which toddlers strive to gain a sense of self-rule over their actions and their bodies

average: children who receive an average number of positive and negative nominations from their peers

cisgender: an umbrella term used to describe people whose sense of personal identity and gender corresponds with their birth sex

clique: used to describe a group of persons who interact with each other more regularly and intensely than others in the same

setting. Cliques are distinguished from "crowds" in that their members interact with one another

controversial: children who are either strongly liked or strongly disliked by quite a few peers

conventional moral development: stages 3 and 4 of moral development where morality is internalized, and the concern is on society norms

crowds: large groups of adolescents defined by their shared image and reputation

delayed gratification: the ability to hold out for a larger reward by forgoing a smaller immediate reward

deviant peer contagion: process by which peers reinforce problem behavior by laughing or showing other signs of approval that then increase the likelihood of future problem behavior

disorganized attachment: a type of attachment that is marked by an infant's inconsistent reactions to the caregiver's departure and return

emotional regulation: the ability to respond to the ongoing demands of experience with the range of emotions in a manner that is socially tolerable and sufficiently flexible to permit spontaneous reactions, as well as the ability to delay spontaneous reactions as needed

false self-training: holding a child to adult standards while denying the child's developmental needs

food insecurity: limited or uncertain availability of safe, nutritious food

foreclosure: term for premature identity formation, which occurs when an adolescent adopts his or her parents' or society's role and values without questioning or analysis, according to Marcia's theory

gender: a term that refers to social or cultural distinctions of behaviors that are considered male or female

gender dysphoria: a condition listed in the DSM-5 in which people whose gender at birth is contrary to the one they identify with. This condition replaces "gender identity disorder"

gender expression: how one demonstrates gender (based on

traditional gender role norms related to clothing, behavior, and interactions); can be feminine, masculine, androgynous, or somewhere along a spectrum

gender identity: the way that one thinks about gender and self-identifies, can be woman, man, or genderqueer

goodness-of-fit: the notion that development is dependent on the degree of match between children's temperament and the nature and demands of the environment in which they are being raised

homophily: a tendency of individuals to form links disproportionately with others like themselves

identity achievement: Erikson's term for the attainment of identity, or the point at which a person understands who he or she is as a unique individual, in accord with past experiences and future plans; already questioned and made commitment according to Marcia's theory

identity vs. role confusion: Erikson's term for the fifth stage of development, in which the person tries to figure out "Who am I?" but is confused as to which of many possible roles to adopt

insecure-avoidant attachment: a pattern of attachment in which an infant avoids connection with the caregiver, as when the infant seems not to care about the caregiver's presence, departure, or even return

insecure-resistant/ambivalent attachment: a pattern of attachment in which an infant's anxiety and uncertainty are evident, as when the infant becomes very upset at separation from the caregiver and both resists and seeks contact on reunion

introjection: a process Freud described where children incorporate values from others into their value set

looking-glass self: the process by which our sense of self develops as we interact with others through various social relationships and incorporate the way those other people view us into our own sense of self

major depression: feelings of hopelessness, lethargy, and worthlessness that last two weeks or more

martyr parent: parent who will do anything for the child, even

tasks that the child should do independently, may later use what they have done for the child to invoke guilt and compliance

moratorium: an adolescent's choice of a socially acceptable way to postpone making identity-achievement decisions. Going to college is a common example. Engaged in questioning, but not yet making a commitment, according to Marcia's theory

negative punishment: a desirable stimulus is removed to decrease a behavior; for example, losing the privilege of playing a desired game or using a desired item

negative reinforcement: an undesirable stimulus is removed to increase a behavior; for example, the car beeping goes away when we click into the seatbelt

neglected: children who tend to go unnoticed but are not especially liked or disliked by their peers

pal parent: wants to be the child's friend and focuses on being entertaining and fun

parasuicide: any potentially lethal action against the self that does not result in death. (also called attempted suicide or failed suicide)

peer pressure: encouragement to conform to one's friends or contemporaries in behavior, dress, and attitude; usually considered a negative force, as when adolescent peers encourage one another to defy adult authority

permissive parenting: involves being a friend to a child rather than an authority figure. Children are allowed to make their own rules and determine their own activities

phallic stage: the third stage in Freud's theory of psychosexual development, lasting from age three to six years, during which the libido (desire) centers upon the genitalia and children become aware of bodies

police officer/drill sergeant parent: focuses primarily on making sure that the child is obedient and that the parent has full control of the child

popular-antisocial: children who gain popularity by acting tough or spreading rumors about others

popular-prosocial: children who are popular because they are nice and have good social skills

positive punishment: an undesirable stimulus is added to decrease a behavior; for example, spanking or receiving a speeding ticket

positive reinforcement: a desirable stimulus is added to increase a behavior; for example, stickers on a behavior chart or words of encouragement

post-conventional moral development: stages 5 and 6 of moral development where morality comes from personal understanding of rights and justice, regardless of whether that understanding matches societal norms

pre-conventional moral development: first 2 stages of moral development where morality comes from outside the person, and the concern is on physical consequences of actions

response inhibition: the ability to recognize a potential behavior and stop the initiation of an undesired behavior

role confusion: a situation in which an adolescent does not seem to know or care what his or her identity is. (Sometimes called identity diffusion or role diffusion)

secure attachment: a relationship in which an infant obtains both comfort and confidence from the presence of their caregiver

secure base: a parental presence that gives children a sense of safety as they explore their surroundings

self-awareness: a person's realization that they are a distinct individual whose body, mind, and actions are separate from those of other people

self-concept: the idea of who we are, what we are capable of doing, and how we think and feel

self-esteem: considered an important component of emotional health, self-esteem encompasses both self-confidence and self-acceptance. It is the way individuals perceive themselves and their self-value

separation anxiety: fear or distress caused by the departure of familiar significant others; most obvious between 9-14 months

sex: a term that denotes the presence of physical or physiological differences between males and females

sexual orientation: a term that refers to whether a person is sexually and romantically attracted to others of the same sex, the opposite sex, or both sexes

social smile: a smile evoked by a human face, normally first evident in infants about 6 weeks after birth

stranger wariness: fear is often associated with the presence of strangers where an infant expresses concern or a look of fear while clinging to a familiar person

suicide: the act of intentionally causing one's own death

suicidal ideation: thinking about suicide, usually with some serious emotional and intellectual or cognitive overtones

teacher-counselor parent: pays a lot of attention to expert advice on parenting and believes that as long as all of the steps are followed, the parent can rear a perfect child

temperament: inborn differences between one person and another in emotions, activity, and self-regulation, typically measured by the person's responses to the environment

toxic stress: excessive stress that exceeds a child's ability to cope, especially in the absence of supportive caregiving from adults

transgender: a term used to describe people whose sense of personal identity does not correspond with their birth sex

trust vs. mistrust: Erikson's first crisis of psychosocial development, during which infants learn basic trust if the world is a secure place where their needs (food, comfort, attention) are met

uninvolved parenting: parents who are disengaged from their children, do not make demands on their children, and are non-responsive

withdrawn-rejected: children who are excluded because they are shy and withdrawn

PHYSICAL DEVELOPMENT IN ADULTHOOD

Learning outcomes

- Describe various definitions of stress, including the difference between stimulus-based and response-based stress and good stress and bad stress
- Describe the contributions of Walter Cannon (fight or flight) and Hans Selye (general adaptation syndrome) to the stress research field
- Explain what occurs in the sympathetic nervous system, and the hypothalamic-pituitary-adrenal system during stress
- Describe different types of possible stressors, including major life readjustments and the connection between stressors, job strain, and job burnout
- Describe how stress impacts the functioning of the immune system
- Describe how stress and emotional factors can lead to the development and exacerbation of cardiovascular disorders
- Define coping and differentiate between problem-focused and emotion-focused coping
- Describe the importance of perceived control in our reactions to stress
- Explain how social support is vital in health and longevity

- Identify common stress reduction techniques
- Summarize the developmental tasks of early adulthood
- Describe physical development and health in early adulthood
- Summarize risky behaviors and causes of death in early adulthood
- Describe sexuality and fertility issues related to early adulthood
- Detail the most important physiological changes occurring in men and women during middle adulthood
- Describe how physiological changes during middle adulthood can impact life experience, health, and sexuality
- Describe age categories of late adulthood
- Explain trends in life expectancies, including factors that contribute to longer life
- Describe primary aging, including vision and hearing loss
- Explain secondary aging concerns that are common in late adulthood, including illnesses and diseases
- Describe and compare theories of aging

Stress

Stress is a process whereby an individual perceives and responds to events appraised as overwhelming or threatening to one's well-being. The scientific study of how stress and emotional factors impact health and well-being is called **health psychology**, a field devoted to studying the general impact of psychological factors on health. While there are circumstances in which stress can be good, we know that stress can have serious negative consequences on the body.

Stressors can be chronic (long term) or acute (short term), and can include traumatic events, significant life changes, daily hassles, and situations in which people are frequently exposed to challenging and unpleasant events. Many potential stressors include events or situations that require us to make changes in our lives, such as a divorce or moving to a new residence. Thomas Holmes and Richard Rahe developed the Social Readjustment Rating Scale (SRRS) to measure stress by assigning a number of life change units to life events that typically require some adjustment, including positive events. Although the SRRS has been criticized on a number of grounds, extensive research has shown that the accumulation of many LCUs is associated with increased risk of illness. Many potential stressors also include daily hassles, which are minor irritations and annoyances that can build up over time. In addition, jobs that are especially demanding, offer little control over one's working environment, or involve unfavorable working conditions can lead to job strain, thereby setting the stage for job burnout.

What is Stress?

The term **stress** as it relates to the human condition first emerged in scientific literature in the 1930s, but it did not enter the popular vernacular until the 1970s (Lyon, 2012). Today, we often use the term loosely in describing a variety of unpleasant feeling states; for example, we often say we are stressed out when we feel frustrated, angry, conflicted, overwhelmed, or fatigued. Despite the widespread use of the term, stress is a fairly vague concept that is difficult to define with precision.

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Video 1. *What is Stress?*

A useful way to conceptualize stress is to view it as a process whereby an individual perceives and responds to events that he appraises as overwhelming or threatening to his well-being (Lazarus & Folkman, 1984). A critical element of this definition is that it emphasizes the importance of how we appraise—that is, judge—demanding or threatening events (often referred to as **stressors**); these appraisals, in turn, influence our reactions to such events. Two kinds of appraisals of a stressor are especially important in this regard: primary and secondary appraisals. A **primary appraisal** involves judgment about the degree of potential harm or threat to well-being that a stressor might entail. A stressor would likely be appraised as a threat if one anticipates that it could lead to some kind of harm, loss, or other negative consequence;

conversely, a stressor would likely be appraised as a challenge if one believes that it carries the potential for gain or personal growth. For example, an employee who is promoted to a leadership position would likely perceive the promotion as a much greater threat if she believed the promotion would lead to excessive work demands than if she viewed it as an opportunity to gain new skills and grow professionally. Similarly, a college student on the cusp of graduation may face the change as a threat or a challenge (Figure 1).

Figure 1*. Graduating from college and entering the workforce can be viewed as either a threat (loss of financial support) or a challenge (opportunity for independence and growth). (credit: Timothy Zanker)*

The perception of a threat triggers a **secondary appraisal**: judgment of the options available to cope with a stressor, as well as perceptions of how effective such options will be (Lyon, 2012) (Figure 2). As you may recall from what you learned about self-efficacy, an individual's belief in his ability to complete a task is important (Bandura, 1994). A threat tends to be viewed as less catastrophic if one believes something can be done about it (Lazarus & Folkman, 1984). Imagine that two middle-aged women, Robin and Maria, perform breast self-examinations one morning and each woman notices a lump on the lower region of her left breast. Although both women view the breast lump as a potential threat (primary appraisal), their secondary appraisals differ considerably. In considering the breast lump, some of the thoughts racing through Robin's mind are, "Oh my God, I could have breast cancer! What if the cancer has spread to the rest of my body and I cannot recover? What if I have to go through chemotherapy? I've heard that experience is awful! What if I have to quit my job? My husband and I won't have enough money to pay the mortgage. Oh, this is just horrible…I can't deal with it!" On the other hand, Maria thinks,

“Hmm, this may not be good. Although most times these things turn out to be benign, I need to have it checked out. If it turns out to be breast cancer, there are doctors who can take care of it because the medical technology today is quite advanced. I’ll have a lot of different options, and I’ll be just fine.” Clearly, Robin and Maria have different outlooks on what might turn out to be a very serious situation: Robin seems to think that little could be done about it, whereas Maria believes that, worst case scenario, a number of options that are likely to be effective would be available. As such, Robin would clearly experience greater stress than would Maria.

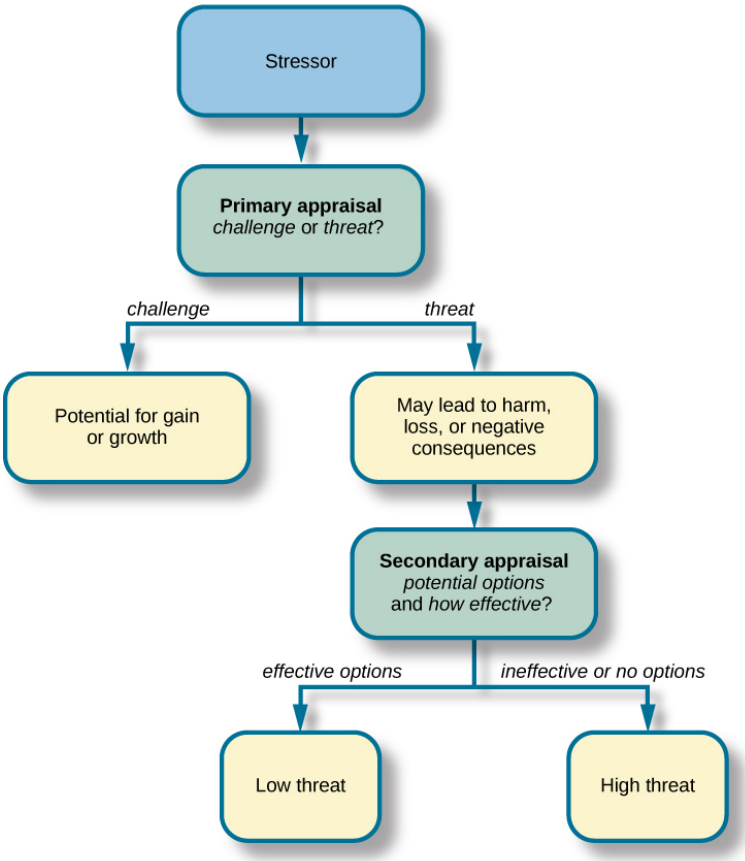

***Figure 2**. When encountering a stressor, a person judges its potential threat (primary appraisal) and then determines if effective options are available to manage the situation. Stress is likely to result if a stressor is perceived as extremely threatening or threatening with few or no effective coping options available.*

To be sure, some stressors are inherently more stressful than others in that they are more threatening and leave less potential for variation in cognitive appraisals (e.g., objective threats to one's health or safety). Nevertheless, appraisal will still play a role in

augmenting or diminishing our reactions to such events (Everly & Lating, 2002).

If a person appraises an event as harmful and believes that the demands imposed by the event exceed the available resources to manage or adapt to it, the person will subjectively experience a state of stress. In contrast, if one does not appraise the same event as harmful or threatening, she is unlikely to experience stress. According to this definition, environmental events trigger stress reactions by the way they are interpreted and the meanings they are assigned. In short, stress is largely in the eye of the beholder: it's not so much what happens to you as it is how you respond (Selye, 1976).

Try It

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Responses to Stress

When stressed, we may have a number of physiological, psychological, and behavioral responses. The type of response may depend on the stressor and our appraisal.

Cannon and the Fight-or-Flight Response

Imagine that you are hiking in the beautiful mountains of Colorado on a warm and sunny spring day. At one point during your hike, a large, frightening-looking black bear appears from behind a stand of trees and sits about 50 yards from you. The bear notices you, sits up, and begins to lumber in your direction. In addition to thinking, "This is definitely not good," a constellation of physiological reactions begins to take place inside you. Prompted by a deluge of epinephrine (adrenaline) and norepinephrine (noradrenaline) from your adrenal glands, your pupils begin to dilate. Your heart starts to pound and speeds up, you begin to breathe heavily and perspire, you get butterflies in your stomach, and your muscles become tense,

preparing you to take some kind of direct action. Cannon proposed that this reaction, which he called the **fight-or-flight response**, occurs when a person experiences very strong emotions—especially those associated with a perceived threat (Cannon, 1932). During the fight-or-flight response, the body is rapidly aroused by activation of both the sympathetic nervous system and the endocrine system (Figure 7). This arousal helps prepare the person to either fight or flee from a perceived threat.

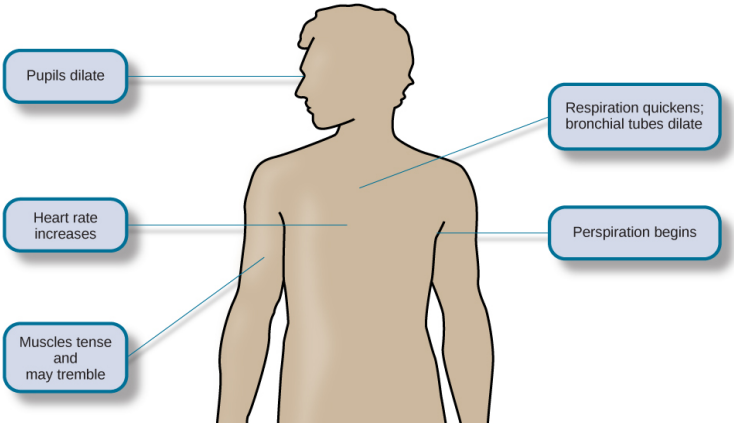

***Figure 3**. Fight or flight is a physiological response to a stressor.*

According to Cannon, the fight-or-flight response is a built-in mechanism that assists in maintaining homeostasis—an internal environment in which physiological variables such as blood pressure, respiration, digestion, and temperature are stabilized at levels optimal for survival. Thus, Cannon viewed the fight-or-flight response as adaptive because it enables us to adjust internally and externally to changes in our surroundings, which is helpful in species survival.

Selye and the General Adaptation Syndrome

Figure 4. *Hans Selye specialized in research about stress. In 2009, his native Hungary honored his work with this stamp, released in conjunction with the 2nd annual World Conference on Stress.*

Another important early contributor to the stress field was Hans Selye, mentioned earlier. He would eventually become one of the world's foremost experts in the study of stress (Figure 8). As a young assistant in the biochemistry department at McGill University in the 1930s, Selye was engaged in research involving sex hormones in rats. Although he was unable to find an answer for what he was initially researching, he incidentally discovered that when exposed to prolonged negative stimulation (**stressors**)—such as extreme cold, surgical injury, excessive muscular exercise, and shock—the rats showed signs of adrenal enlargement, thymus and lymph node shrinkage, and stomach ulceration. Selye realized that these responses were triggered by a coordinated series of physiological reactions that unfold over time during continued exposure to a stressor. These physiological reactions were nonspecific, which means that regardless of the type of stressor, the same pattern of reactions would occur. What Selye discovered was the general adaptation syndrome, the body's nonspecific physiological response to stress.

The general adaptation syndrome, shown in Figure 9, consists of three stages: (1) alarm reaction, (2) stage of resistance, and (3) stage of exhaustion (Selye, 1936; 1976). **Alarm reaction** describes the body's immediate reaction upon facing a threatening situation or emergency, and it is roughly analogous to the fight-or-flight response described by Cannon. During an alarm reaction, you are alerted to a stressor, and your body alarms you with a cascade of

physiological reactions that provide you with the energy to manage the situation. A person who wakes up in the middle of the night to discover her house is on fire, for example, is experiencing an alarm reaction.

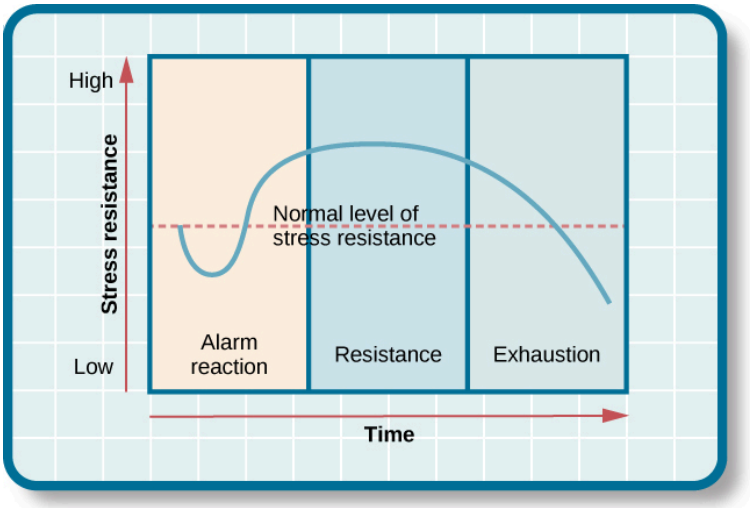

Figure 5*. The three stages of Selye's general adaptation syndrome are shown in this graph. Prolonged stress ultimately results in exhaustion.*

If exposure to a stressor is prolonged, the organism will enter the **stage of resistance**. During this stage, the initial shock of alarm reaction has worn off and the body has adapted to the stressor. Nevertheless, the body also remains on alert and is prepared to respond as it did during the alarm reaction, although with less intensity. For example, suppose a child who went missing is still missing 72 hours later. Although the parents would obviously remain extremely disturbed, the magnitude of physiological reactions would likely have diminished over the 72 intervening hours due to some adaptation to this event.

If exposure to a stressor continues over a longer period of time, the **stage of exhaustion** ensues. At this stage, the person is no

longer able to adapt to the stressor: the body's ability to resist becomes depleted as physical wear takes its toll on the body's tissues and organs. As a result, illness, disease, and other permanent damage to the body—even death—may occur. If a missing child still remained missing after three months, the long-term stress associated with this situation may cause a parent to literally faint with exhaustion at some point or even to develop a serious and irreversible illness.

In short, Selye's general adaptation syndrome suggests that stressors tax the body via a three-phase process—an initial jolt, subsequent readjustment, and a later depletion of all physical resources—that ultimately lays the groundwork for serious health problems and even death. It should be pointed out, however, that this model is a response-based conceptualization of stress, focusing exclusively on the body's physical responses while largely ignoring psychological factors such as appraisal and interpretation of threats. Nevertheless, Selye's model has had an enormous impact on the field of stress because it offers a general explanation for how stress can lead to physical damage and, thus, disease. As we shall discuss later, prolonged or repeated stress has been implicated in development of a number of disorders such as hypertension and coronary artery disease.

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The Physiological Basis of Stress

What goes on inside our bodies when we experience stress? The physiological mechanisms of stress are extremely complex, but they generally involve the work of two systems—the **sympathetic nervous system** and the **hypothalamic-pituitary-adrenal (HPA)** axis. When a person first perceives something as stressful (Selye's alarm reaction), the sympathetic nervous system triggers arousal via the release of adrenaline from the adrenal glands. Release of these hormones activates the **fight-or-flight** responses to stress,

such as accelerated heart rate and respiration. At the same time, the HPA axis, which is primarily endocrine in nature, becomes especially active, although it works much more slowly than the sympathetic nervous system. In response to stress, the hypothalamus (one of the limbic structures in the brain) releases corticotrophin-releasing factor, a hormone that causes the pituitary gland to release adrenocorticotropic hormone (ACTH) (Figure 10). The ACTH then activates the adrenal glands to secrete a number of hormones into the bloodstream; an important one is cortisol, which can affect virtually every organ within the body. Cortisol is commonly known as a stress hormone and helps provide that boost of energy when we first encounter a stressor, preparing us to run away or fight. However, sustained elevated levels of cortisol weaken the immune system.

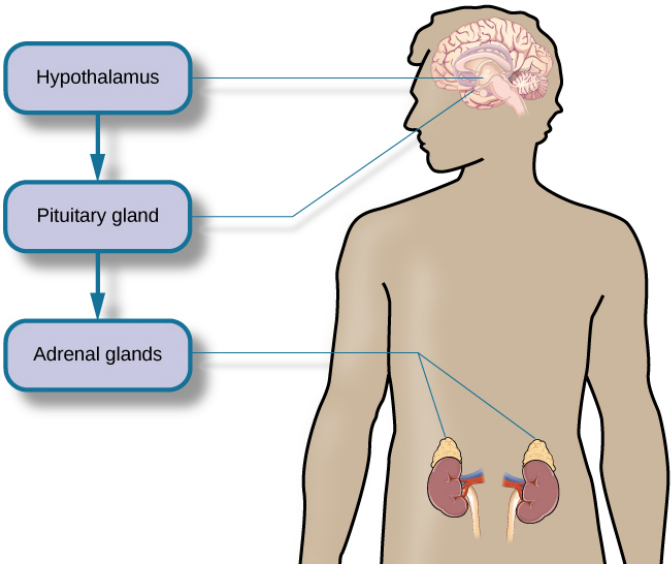

***Figure 6**. This diagram shows the functioning of the hypothalamic-pituitary-adrenal (HPA) axis. The hypothalamus activates the pituitary gland, which in turn activates the adrenal glands, increasing their secretion of cortisol.*

In short bursts, this process can have some favorable effects, such as providing extra energy, improving immune system functioning temporarily, and decreasing pain sensitivity. However, extended release of cortisol—as would happen with prolonged or chronic stress—often comes at a high price. High levels of cortisol have been shown to produce a number of harmful effects. For example, increases in cortisol can significantly weaken our immune system (Glaser & Kiecolt-Glaser, 2005), and high levels are frequently observed among depressed individuals (Geoffroy, Hertzman, Li, & Power, 2013). In summary, a stressful event causes a variety of physiological reactions that activate the adrenal glands, which in turn release epinephrine, norepinephrine, and cortisol. These hormones affect a number of bodily processes in ways that prepare the stressed person to take direct action, but also in ways that may heighten the potential for illness.

When stress is extreme or chronic, it can have profoundly negative consequences. For example, stress often contributes to the development of certain psychological disorders, including post-traumatic stress disorder, major depressive disorder, and other serious psychiatric conditions. Additionally, we noted earlier that stress is linked to the development and progression of a variety of physical illnesses and diseases. For example, researchers in one study found that people injured during the September 11, 2001, World Trade Center disaster or who developed post-traumatic stress symptoms afterward later suffered significantly elevated rates of heart disease (Jordan, Miller-Archie, Cone, Morabia, & Stellman, 2011). Another investigation yielded that self-reported stress symptoms among aging and retired Finnish food industry workers were associated with morbidity 11 years later. This study also predicted the onset of musculoskeletal, nervous system, and endocrine and metabolic disorders (Salonen, Arola, Nygård, & Huhtala, 2008). Another study reported that male South Korean manufacturing employees who reported high levels of work-related stress were more likely to catch the common cold over the next several months than were those employees who reported lower

work-related stress levels (Park et al., 2011). Later, you will explore the mechanisms through which stress can produce physical illness and disease.

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Stressors

Good Stress?

Although stress carries a negative connotation, at times it may be of some benefit. Stress can motivate us to do things in our best interests, such as study for exams, visit the doctor regularly, exercise, and perform to the best of our ability at work. Indeed, Selye (1974) pointed out that not all stress is harmful. He argued that stress can sometimes be a positive, motivating force that can improve the quality of our lives. This kind of stress, which Selye called **eustress** (from the Greek *eu* = "good"), is a good kind of stress associated with positive feelings, optimal health, and performance. A moderate amount of stress can be beneficial in challenging situations. For example, athletes may be motivated and energized by pregame stress, and students may experience similar beneficial stress before a major exam. Indeed, research shows that moderate stress can enhance both immediate and delayed recall of educational material. Male participants in one study who memorized a scientific text passage showed improved memory of the passage immediately after exposure to a mild stressor as well as one day following exposure to the stressor (Hupbach & Fieman, 2012).

Increasing one's level of stress will cause performance to change in a predictable way. As shown in Figure 3, as stress increases, so do performance and general well-being (eustress); when stress levels reach an optimal level (the highest point of the curve), performance reaches its peak. A person at this stress level is colloquially at the top of his game, meaning he feels fully energized, focused, and can work with minimal effort and maximum efficiency. But when stress exceeds this optimal level, it is no longer a positive force—it becomes excessive and debilitating, or what Selye termed **distress** (from the Latin *dis* = "bad"). People who reach this level of stress feel

burned out; they are fatigued, exhausted, and their performance begins to decline. If the stress remains excessive, health may begin to erode as well (Everly & Lating, 2002).

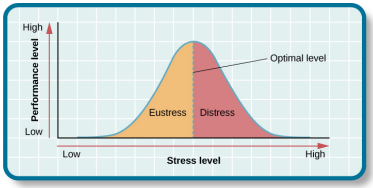


Figure 7*. As the stress level increases from low to moderate, so does performance (eustress). At the optimal level (the peak of the curve), performance has reached its peak. If stress exceeds the optimal level, it will reach the distress region, where it will become excessive and debilitating, and performance will decline (Everly & Lating, 2002).*

The Prevalence of Stress

Stress is everywhere and, as shown in Figure 4, it has been on the rise over the last several years. Each of us is acquainted with stress—some are more familiar than others. In many ways, stress feels like a load you just can't carry—a feeling you experience when, for example, you have to drive somewhere in a crippling blizzard, when you wake up late the morning of an important job interview, when you run out of money before the next pay period, and before taking an important exam for which you realize you are not fully prepared.

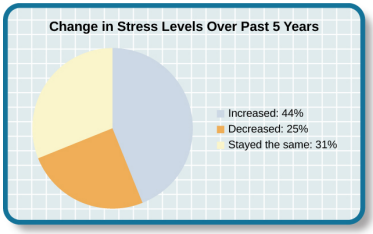


Figure 8*. Nearly half of U.S. adults indicated that their stress levels have increased over the last five years (Neelakantan, 2013).*

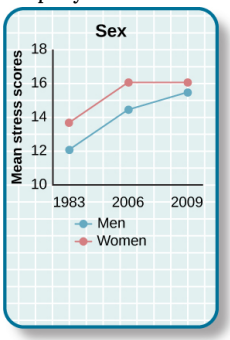
Stress is an experience that evokes a variety of responses, including those that are physiological (e.g., accelerated heart rate, headaches, or gastrointestinal problems), cognitive (e.g., difficulty concentrating or making decisions), and behavioral (e.g., drinking alcohol, smoking, or taking actions directed at eliminating the cause of the stress). Although stress can be positive at times, it can have deleterious

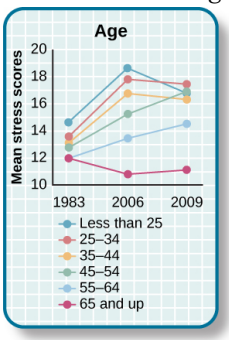
health implications, contributing to the onset and progression of a variety of physical illnesses and diseases (Cohen & Herbert, 1996).

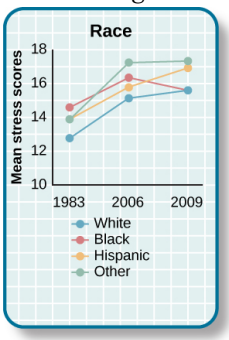
The scientific study of how stress and other psychological factors impact health falls within the realm of **health psychology**, a subfield of psychology devoted to understanding the importance of psychological influences on health, illness, and how people respond when they become ill (Taylor, 1999). Health psychology emerged as a discipline in the 1970s, a time during which there was increasing awareness of the role behavioral and lifestyle factors play in the development of illnesses and diseases (Straub, 2007). In addition to studying the connection between stress and illness, health psychologists investigate issues such as why people make certain lifestyle choices (e.g., smoking or eating unhealthy food despite knowing the potential adverse health implications of such behaviors). Health psychologists also design and investigate the effectiveness of interventions aimed at changing unhealthy behaviors. Perhaps one of the more fundamental tasks of health psychologists is to identify which groups of people are especially at risk for negative health outcomes, based on psychological or behavioral factors. For example, measuring differences in stress levels among demographic groups and how these levels change over time can help identify populations who may have an increased risk for illness or disease.

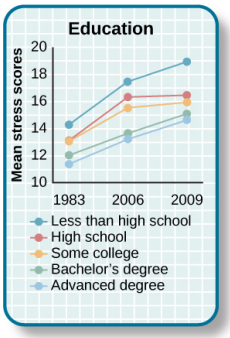
Figure 5 depicts the results of three national surveys in which several thousand individuals from different demographic groups completed a brief stress questionnaire; the surveys were administered in 1983, 2006, and 2009 (Cohen & Janicki-Deverts, 2012). All three surveys demonstrated higher stress in women than in men. Unemployed individuals reported high levels of stress in all three surveys, as did those with less education and income; retired persons reported the lowest stress levels. However, from 2006 to 2009 the greatest increase in stress levels occurred among men, Whites, people aged 45–64, college graduates, and those with full-time employment. One interpretation of these findings is that concerns surrounding the 2008–2009 economic downturn (e.g.,

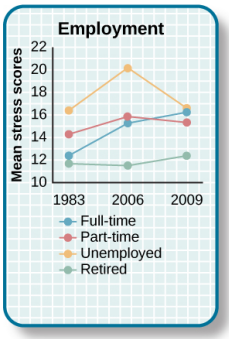
threat of or actual job loss and substantial loss of retirement savings) may have been especially stressful to White, college-educated, employed men with limited time remaining in their working careers.

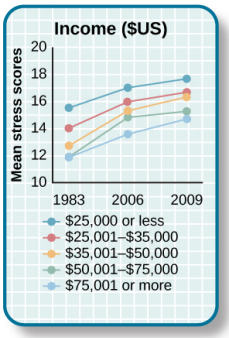












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For an individual to experience stress, he must first encounter a potential stressor. In general, stressors can be placed into one of two broad categories: chronic and acute. Chronic stressors include events that persist over an extended period of time, such as caring for a parent with dementia, long-term unemployment, or imprisonment. Acute stressors involve brief focal events that sometimes continue to be experienced as overwhelming well after the event has ended, such as falling on an icy sidewalk and breaking your leg (Cohen, Janicki-Deverts, & Miller, 2007). Whether chronic or acute, potential stressors come in many shapes and sizes. They can include major traumatic events, significant life changes, daily hassles, as well as other situations in which a person is regularly exposed to threat, challenge, or danger.

Traumatic Events

Some stressors involve traumatic events or situations in which a person is exposed to actual or threatened death or serious injury. Stressors in this category include exposure to military combat,

threatened or actual physical assaults (e.g., physical attacks, sexual assault, robbery, childhood abuse), terrorist attacks, natural disasters (e.g., earthquakes, floods, hurricanes), and automobile accidents. Men, non-Whites, and individuals in lower socioeconomic status (SES) groups report experiencing a greater number of traumatic events than do women, Whites, and individuals in higher SES groups (Hatch & Dohrenwend, 2007). Some individuals who are exposed to stressors of extreme magnitude develop post-traumatic stress disorder (PTSD): a chronic stress reaction characterized by experiences and behaviors that may include intrusive and painful memories of the stressor event, jumpiness, persistent negative emotional states, detachment from others, angry outbursts, and avoidance of reminders of the event (American Psychiatric Association [APA], 2013).

Life Changes

Most stressors that we encounter are not nearly as intense as the ones described above. Many potential stressors we face involve events or situations that require us to make changes in our ongoing lives and require time as we adjust to those changes. Examples include death of a close family member, marriage, divorce, and moving (Figure 1).

In the 1960s, psychiatrists Thomas Holmes and Richard Rahe wanted to examine the link between life stressors and physical illness, based on the hypothesis that life events requiring significant changes in a person's normal life routines are stressful, whether these events are desirable or undesirable. They developed the **Social Readjustment Rating Scale (SRRS)**, consisting of 43 life events that require varying degrees of personal readjustment (Holmes & Rahe, 1967). Many life events that most people would consider pleasant (e.g., holidays, retirement, marriage) are among those listed on the SRRS; these are examples of eustress. Holmes and Rahe also proposed that life events can add up over time, and that experiencing a cluster of stressful events increases one's risk of developing physical illnesses.

Figure 9. *Some fairly typical life events, such as moving, can be significant stressors. Even when the move is intentional and positive, the amount of resulting change in daily life can cause stress. (credit: "Jellaluna"/Flickr)*

In developing their scale, Holmes and Rahe asked 394 participants to provide a numerical estimate for each of the 43 items; each estimate corresponded to how much readjustment participants felt each event would require. These estimates resulted in mean value scores for each event—often called life change units (LCUs) (Rahe, McKeen, & Arthur, 1967). The numerical scores ranged from 11 to 100, representing the perceived magnitude of life change each event entails. Death of a spouse ranked highest on the scale with 100 LCUs, and divorce ranked second highest with 73 LCUs. In addition, personal injury or illness, marriage, and job termination also ranked highly on the scale with 53, 50, and 47 LCUs, respectively. Conversely, change in residence (20 LCUs), change in eating habits (15 LCUs), and vacation (13 LCUs) ranked low on the scale (Table 1). Minor violations of the law ranked the lowest with 11 LCUs. To complete the scale, participants checked yes for events experienced

within the last 12 months. LCUs for each checked item are totaled for a score quantifying the amount of life change. Agreement on the amount of adjustment required by the various life events on the SRRS is highly consistent, even cross-culturally (Holmes & Masuda, 1974).

Table 1. Some Stressors on the Social Readjustment Rating Scale (Holmes & Rahe, 1967)

Life event	Life change units
Death of a close family member	63
Personal injury or illness	53
Dismissal from work	47
Change in financial state	38
Change to different line of work	36
Outstanding personal achievement	28
Beginning or ending school	26
Change in living conditions	25
Change in working hours or conditions	20
Change in residence	20
Change in schools	20
Change in social activities	18
Change in sleeping habits	16
Change in eating habits	15
Minor violation of the law	11

Extensive research has demonstrated that accumulating a high number of life change units within a brief period of time (one or two years) is related to a wide range of physical illnesses (even accidents and athletic injuries) and mental health problems (Monat & Lazarus, 1991; Scully, Tosi, & Banning, 2000). In an early demonstration, researchers obtained LCU scores for U.S. and Norwegian Navy personnel who were about to embark on a six-month voyage. A later examination of medical records revealed positive (but small)

correlations between LCU scores prior to the voyage and subsequent illness symptoms during the ensuing six-month journey (Rahe, 1974). In addition, people tend to experience more physical symptoms, such as backache, upset stomach, diarrhea, and acne, on specific days in which self-reported LCU values are considerably higher than normal, such as the day of a family member's wedding (Holmes & Holmes, 1970).

The Social Readjustment Rating Scale (SRRS) provides researchers a simple, easy-to-administer way of assessing the amount of stress in people's lives, and it has been used in hundreds of studies (Thoits, 2010). Despite its widespread use, the scale has been subject to criticism. First, many of the items on the SRRS are vague; for example, death of a close friend could involve the death of a long-absent childhood friend that requires little social readjustment (Dohrenwend, 2006). In addition, some have challenged its assumption that undesirable life events are no more stressful than desirable ones (Derogatis & Coons, 1993). However, most of the available evidence suggests that, at least as far as mental health is concerned, undesirable or negative events are more strongly associated with poor outcomes (such as depression) than are desirable, positive events (Hatch & Dohrenwend, 2007). Perhaps the most serious criticism is that the scale does not take into consideration respondents' appraisals of the life events it contains. As you recall, appraisal of a stressor is a key element in the conceptualization and overall experience of stress. Being fired from work may be devastating to some but a welcome opportunity to obtain a better job for others. The SRRS remains one of the most well-known instruments in the study of stress, and it is a useful tool for identifying potential stress-related health outcomes (Scully et al., 2000).

Link to Learning

Go to this site to complete the SRRS scale and determine the total number of LCUs you have experienced over the last year.

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Hassles

Potential stressors do not always involve major life events. **Daily hassles**—the minor irritations and annoyances that are part of our everyday lives (e.g., rush hour traffic, lost keys, obnoxious coworkers, inclement weather, arguments with friends or family)—can build on one another and leave us just as stressed as life change events (Figure 2) (Kanner, Coyne, Schaefer, & Lazarus, 1981).

(a)

(b)

Figure 10. *Daily commutes, whether (a) on the road or (b) via public transportation, can be hassles that contribute to our feelings of everyday stress. (credit a: modification of work by Jeff Turner; credit b: modification of work by "epSos.de"/Flickr)*

Researchers have demonstrated that the frequency of daily hassles is actually a better predictor of both physical and psychological health than are life change units. In a well-known study of San Francisco residents, the frequency of daily hassles was found to be more strongly associated with physical health problems than were life change events (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982). In addition, daily minor hassles, especially interpersonal conflicts, often lead to negative and distressed mood states (Bolger, DeLongis, Kessler, & Schilling, 1989). Cyber hassles that occur on social media may represent a new source of stress. In one investigation, undergraduates who, over a 10-week period, reported greater Facebook-induced stress (e.g., guilt or discomfort over rejecting friend requests and anger or sadness over being unfriended by another) experienced increased rates of upper respiratory infections, especially if they had larger social networks (Campisi et al., 2012). Clearly, daily hassles can add up and take a toll on us both emotionally and physically.

Other Stressors

Stressors can include situations in which one is frequently exposed to challenging and unpleasant events, such as difficult, demanding, or unsafe working conditions. Although most jobs and occupations can at times be demanding, some are clearly more stressful than others (Figure 3). For example, most people would likely agree that a firefighter's work is inherently more stressful than that of a florist. Equally likely, most would agree that jobs containing various unpleasant elements, such as those requiring exposure to loud noise (heavy equipment operator), constant harassment and threats of physical violence (prison guard), perpetual frustration (bus driver in a major city), or those mandating that an employee work alternating day and night shifts (hotel desk clerk), are much more demanding—and thus, more stressful—than those that do not

contain such elements. Table 2 lists several occupations and some of the specific stressors associated with those occupations (Sulsky & Smith, 2005).

(a)

(b)

Figure 11. *(a) Police officers and (b) firefighters hold high stress occupations. (credit a: modification of work by Australian Civil-Military Centre; credit b: modification of work by Andrew Magill)*

Table 2. Occupations and Their Related Stressors

Occupation	Stressors Specific to Occupation (Sulsky & Smith, 2005)
Police officer	physical dangers, excessive paperwork, red tape, dealing with court system, coworker and supervisor conflict, lack of support from the public
Firefighter	uncertainty over whether a serious fire or hazard awaits after an alarm
Social worker	little positive feedback from jobs or from the public, unsafe work environments, frustration in dealing with bureaucracy, excessive paperwork, sense of personal responsibility for clients, work overload
Teacher	Excessive paperwork, lack of adequate supplies or facilities, work overload, lack of positive feedback, vandalism, threat of physical violence
Nurse	Work overload, heavy physical work, patient concerns (dealing with death and medical concerns), interpersonal problems with other medical staff (especially physicians)
Emergency medical worker	Unpredictable and extreme nature of the job, inexperience
Air traffic controller	Little control over potential crisis situations and workload, fear of causing an accident, peak traffic situations, general work environment
Clerical and secretarial work	Little control over job mobility, unsupportive supervisors, work overload, lack of perceived control
Managerial work	Work overload, conflict and ambiguity in defining the managerial role, difficult work relationships

Although the specific stressors for these occupations are diverse, they seem to share two common denominators: heavy workload and uncertainty about and lack of control over certain aspects of a job. Both of these factors contribute to **job strain**, a work situation that combines excessive job demands and workload with little discretion in decision making or job control (Karasek & Theorell, 1990). Clearly, many occupations other than the ones listed in Table 2 involve at least a moderate amount of job strain in that they often involve heavy workloads and little job control (e.g., inability to decide when to take breaks). Such jobs are often low-status and include those

of factory workers, postal clerks, supermarket cashiers, taxi drivers, and short-order cooks. Job strain can have adverse consequences on both physical and mental health; it has been shown to be associated with increased risk of hypertension (Schnall & Landsbergis, 1994), heart attacks (Theorell et al., 1998), recurrence of heart disease after a first heart attack (Aboa-Éboulé et al., 2007), significant weight loss or gain (Kivimäki et al., 2006), and major depressive disorder (Stansfeld, Shipley, Head, & Fuhrer, 2012). A longitudinal study of over 10,000 British civil servants reported that workers under 50 years old who earlier had reported high job strain were 68% more likely to later develop heart disease than were those workers under 50 years old who reported little job strain (Chandola et al., 2008).

Some people who are exposed to chronically stressful work conditions can experience **job burnout**, which is a general sense of emotional exhaustion and cynicism in relation to one's job (Maslach & Jackson, 1981). Job burnout occurs frequently among those in human service jobs (e.g., social workers, teachers, therapists, and police officers). Job burnout consists of three dimensions. The first dimension is exhaustion—a sense that one's emotional resources are drained or that one is at the end of her rope and has nothing more to give at a psychological level. Second, job burnout is characterized by depersonalization: a sense of emotional detachment between the worker and the recipients of his services, often resulting in callous, cynical, or indifferent attitudes toward these individuals. Third, job burnout is characterized by diminished personal accomplishment, which is the tendency to evaluate one's work negatively by, for example, experiencing dissatisfaction with one's job-related accomplishments or feeling as though one has categorically failed to influence others' lives through one's work.

Job strain appears to be one of the greatest risk factors leading to job burnout, which is most commonly observed in workers who are older (ages 55–64), unmarried, and whose jobs involve manual labor. Heavy alcohol consumption, physical inactivity, being overweight, and having a physical or lifetime mental disorder are also associated

with job burnout (Ahola, et al., 2006). In addition, depression often co-occurs with job burnout. One large-scale study of over 3,000 Finnish employees reported that half of the participants with severe job burnout had some form of depressive disorder (Ahola et al., 2005). Job burnout is often precipitated by feelings of having invested considerable energy, effort, and time into one's work while receiving little in return (e.g., little respect or support from others or low pay) (Tatris, Peeters, Le Blanc, Schreurs, & Schaufeli, 2001).

As an illustration, consider CharlieAnn, a nursing assistant who worked in a nursing home. CharlieAnn worked long hours for little pay in a difficult facility. Her supervisor was domineering, unpleasant, and unsupportive; he was disrespectful of CharlieAnn's personal time, frequently informing her at the last minute she must work several additional hours after her shift ended or that she must report to work on weekends. CharlieAnn had very little autonomy at her job. She had little say in her day-to-day duties and how to perform them, and she was not permitted to take breaks unless her supervisor explicitly told her that she could. CharlieAnn did not feel as though her hard work was appreciated, either by supervisory staff or by the residents of the home. She was very unhappy over her low pay, and she felt that many of the residents treated her disrespectfully.

After several years, CharlieAnn began to hate her job. She dreaded going to work in the morning, and she gradually developed a callous, hostile attitude toward many of the residents. Eventually, she began to feel as though she could no longer help the nursing home residents. CharlieAnn's absenteeism from work increased, and one day she decided that she had had enough and quit. She now has a job in sales, vowing never to work in nursing again.

Finally, our close relationships with friends and family—particularly the negative aspects of these relationships—can be a potent source of stress. Negative aspects of close relationships can include adverse exchanges and conflicts, lack of emotional support or confiding, and lack of reciprocity. All of these can be overwhelming, threatening to the relationship, and thus stressful.

Such stressors can take a toll both emotionally and physically. A longitudinal investigation of over 9,000 British civil servants found that those who at one point had reported the highest levels of negative interactions in their closest relationship were 34% more likely to experience serious heart problems (fatal or nonfatal heart attacks) over a 13–15 year period, compared to those who experienced the lowest levels of negative interaction (De Vogli, Chandola & Marmot, 2007).

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Responses to Stress

As stress researcher Robert Sapolsky (1998) describes,

> stress-related disease emerges, predominantly, out of the fact that we so often activate a physiological system that has evolved for responding to acute physical emergencies, but we turn it on for months on end, worrying about mortgages, relationships, and promotions. (p. 6)

The stress response, as noted earlier, consists of a coordinated but complex system of physiological reactions that are called upon as needed. These reactions are beneficial at times because they prepare us to deal with potentially dangerous or threatening situations (for example, recall our old friend, the fearsome bear on the trail). However, health is affected when physiological reactions are sustained, as can happen in response to ongoing stress. A number of studies have demonstrated that stress weakens the functioning of the immune system. Cardiovascular disorders are

serious medical conditions that have been consistently shown to be influenced by stress and negative emotions, such as anger, negative affectivity, and depression. Other psychophysiological disorders that are known to be influenced by stress and emotional factors include asthma and tension headaches.

Psychophysiological Disorders

If the reactions that compose the stress response are chronic or if they frequently exceed normal ranges, they can lead to cumulative wear and tear on the body, in much the same way that running your air conditioner on full blast all summer will eventually cause wear and tear on it. For example, the high blood pressure that a person under considerable job strain experiences might eventually take a toll on his heart and set the stage for a heart attack or heart failure. Also, someone exposed to high levels of the stress hormone cortisol might become vulnerable to infection or disease because of weakened immune system functioning (McEwen, 1998).

Physical disorders or diseases whose symptoms are brought about or worsened by stress and emotional factors are called **psychophysiological disorders**. The physical symptoms of psychophysiological disorders are real and they can be produced or exacerbated by psychological factors (hence the *psycho* and *physiological* in psychophysiological). A list of frequently encountered psychophysiological disorders is provided in Table 1.

Table 1. Types of Psychophysiological Disorders (adapted from Everly & Lating, 2002)

Type of Psychophysiological Disorder	Examples
Cardiovascular	hypertension, coronary heart disease
Gastrointestinal	irritable bowel syndrome
Respiratory	asthma, allergy
Musculoskeletal	low back pain, tension headaches
Skin	acne, eczema, psoriasis

In addition to stress itself, emotional upset and certain stressful personality traits have been proposed as potential contributors to ill health. Franz Alexander (1950), an early-20th-century psychoanalyst and physician, once postulated that various diseases are caused by specific unconscious conflicts. For example, he linked hypertension to repressed anger, asthma to separation anxiety, and ulcers to an unconscious desire to "remain in the dependent infantile situation—to be loved and cared for" (Alexander, 1950, p. 102). Although hypertension does appear to be linked to anger (as you will learn below), Alexander's assertions have not been supported by research. Years later, Friedman and Booth-Kewley (1987), after statistically reviewing 101 studies examining the link between personality and illness, proposed the existence of disease-prone personality characteristics, including depression, anger/hostility, and anxiety. Indeed, a study of over 61,000 Norwegians identified depression as a risk factor for all major disease-related causes of death (Mykletun et al., 2007). In addition, neuroticism—a personality trait that reflects how anxious, moody, and sad one is—has been identified as a risk factor for chronic health problems and mortality (Ploubidis & Grundy, 2009).

Before we discuss two kinds of psychophysiological disorders about which a great deal is known: cardiovascular disorders and asthma, it is necessary to turn our attention to a discussion of the

immune system—one of the major pathways through which stress and emotional factors can lead to illness and disease.

Stress and the Immune System

In a sense, the **immune system** is the body's surveillance system. It consists of a variety of structures, cells, and mechanisms that serve to protect the body from invading toxins and microorganisms that can harm or damage the body's tissues and organs. When the immune system is working as it should, it keeps us healthy and disease free by eliminating bacteria, viruses, and other foreign substances that have entered the body (Everly & Lating, 2002).

Immune System Errors

Sometimes, the immune system will function erroneously. For example, sometimes it can go awry by mistaking your body's own healthy cells for invaders and repeatedly attacking them. When this happens, the person is said to have an autoimmune disease, which can affect almost any part of the body. How an autoimmune disease affects a person depends on what part of the body is targeted. For instance, rheumatoid arthritis, an autoimmune disease that affects the joints, results in joint pain, stiffness, and loss of function. Systemic lupus erythematosus, an autoimmune disease that affects the skin, can result in rashes and swelling of the skin. Grave's disease, an autoimmune disease that affects the thyroid gland, can result in fatigue, weight gain, and muscle aches (National Institute of Arthritis and Musculoskeletal and Skin Diseases [NIAMS], 2012).

In addition, the immune system may sometimes break down and be unable to do its job. This situation is referred to as **immunosuppression**, the decreased effectiveness of the immune

system. When people experience immunosuppression, they become susceptible to any number of infections, illness, and diseases. For example, acquired immune deficiency syndrome (AIDS) is a serious and lethal disease that is caused by human immunodeficiency virus (HIV), which greatly weakens the immune system by infecting and destroying antibody-producing cells, thus rendering a person vulnerable to any of a number of opportunistic infections (Powell, 1996).

Stressors and Immune Function

The question of whether stress and negative emotional states can influence immune function has captivated researchers for over three decades, and discoveries made over that time have dramatically changed the face of health psychology (Kiecolt-Glaser, 2009). **Psychoneuroimmunology** is the field that studies how psychological factors such as stress influence the immune system and immune functioning. The term psychoneuroimmunology was first coined in 1981, when it appeared as the title of a book that reviewed available evidence for associations between the brain, endocrine system, and immune system (Zacharie, 2009). To a large extent, this field evolved from the discovery that there is a connection between the central nervous system and the immune system.

Some of the most compelling evidence for a connection between the brain and the immune system comes from studies in which researchers demonstrated that immune responses in animals could be classically conditioned (Everly & Lating, 2002). For example, Ader and Cohen (1975) paired flavored water (the conditioned stimulus) with the presentation of an immunosuppressive drug (the unconditioned stimulus), causing sickness (an unconditioned response). Not surprisingly, rats exposed to this pairing developed a conditioned aversion to the flavored water. However, the taste of

the water itself later produced immunosuppression (a conditioned response), indicating that the immune system itself had been conditioned. Many subsequent studies over the years have further demonstrated that immune responses can be classically conditioned in both animals and humans (Ader & Cohen, 2001). Thus, if classical conditioning can alter immunity, other psychological factors should be capable of altering it as well.

Hundreds of studies involving tens of thousands of participants have tested many kinds of brief and chronic stressors and their effect on the immune system (e.g., public speaking, medical school examinations, unemployment, marital discord, divorce, death of spouse, burnout and job strain, caring for a relative with Alzheimer's disease, and exposure to the harsh climate of Antarctica). It has been repeatedly demonstrated that many kinds of stressors are associated with poor or weakened immune functioning (Glaser & Kiecolt-Glaser, 2005; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Segerstrom & Miller, 2004).

When evaluating these findings, it is important to remember that there is a tangible physiological connection between the brain and the immune system. For example, the sympathetic nervous system innervates immune organs such as the thymus, bone marrow, spleen, and even lymph nodes (Maier, Watkins, & Fleshner, 1994). Also, we noted earlier that stress hormones released during hypothalamic-pituitary-adrenal (HPA) axis activation can adversely impact immune function. One way they do this is by inhibiting the production of **lymphocytes**, white blood cells that circulate in the body's fluids that are important in the immune response (Everly & Lating, 2002).

Some of the more dramatic examples demonstrating the link between stress and impaired immune function involve studies in which volunteers were exposed to viruses. The rationale behind this research is that because stress weakens the immune system, people with high stress levels should be more likely to develop an illness compared to those under little stress. In one memorable experiment using this method, researchers interviewed 276 healthy volunteers

about recent stressful experiences (Cohen et al., 1998). Following the interview, these participants were given nasal drops containing the cold virus (in case you are wondering why anybody would ever want to participate in a study in which they are subjected to such treatment, the participants were paid $800 for their trouble). When examined later, participants who reported experiencing chronic stressors for more than one month—especially enduring difficulties involving work or relationships—were considerably more likely to have developed colds than were participants who reported no chronic stressors (Figure 1).

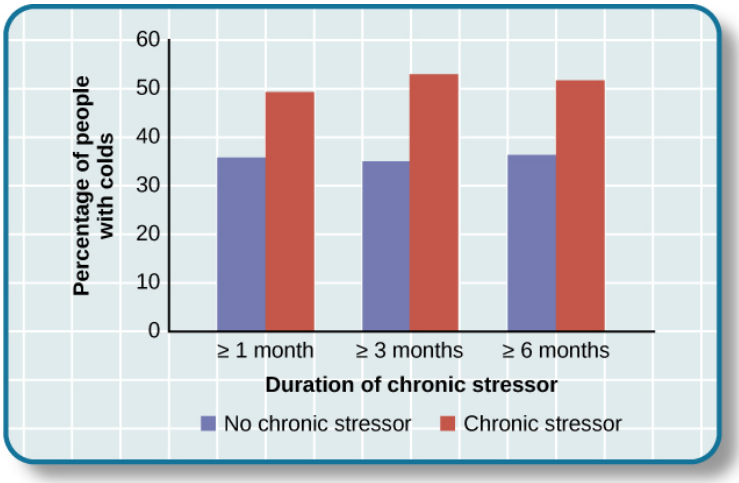

***Figure 12**. This graph shows the percentages of participants who developed colds (after receiving the cold virus) after reporting having experienced chronic stressors lasting at least one month, three months, and six months (adapted from Cohen et al., 1998).*

In another study, older volunteers were given an influenza virus vaccination. Compared to controls, those who were caring for a spouse with Alzheimer's disease (and thus were under chronic stress) showed poorer antibody response following the vaccination (Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996).

Other studies have demonstrated that stress slows down wound healing by impairing immune responses important to wound repair (Glaser & Kiecolt-Glaser, 2005). In one study, for example, skin blisters were induced on the forearm. Subjects who reported higher levels of stress produced lower levels of immune proteins necessary for wound healing (Glaser et al., 1999). Stress, then, is not so much the sword that kills the knight, so to speak; rather, it's the sword that breaks the knight's shield, and your immune system is that shield.

Stress and Aging: A Tale of Telomeres

Have you ever wondered why people who are stressed often seem to have a haggard look about them? A pioneering study from 2004 suggests that the reason is because stress can actually accelerate the cell biology of aging.

Stress, it seems, can shorten telomeres, which are segments of DNA that protect the ends of chromosomes. Shortened telomeres can inhibit or block cell division, which includes growth and proliferation of new cells, thereby leading to more rapid aging (Sapolsky, 2004). In the study, researchers compared telomere lengths in the white blood cells in mothers of chronically ill children to those of mothers of healthy children (Epel et al., 2004). Mothers of chronically ill children would be expected to experience more stress than would mothers of healthy children. The longer a mother had spent caring for her ill child, the shorter her telomeres (the correlation between years of caregiving and telomere length was $r = -.40$). In addition, higher levels of perceived stress were negatively correlated with telomere size ($r = -.31$). These researchers also found

that the average telomere length of the most stressed mothers, compared to the least stressed, was similar to what you would find in people who were 9–17 years older than they were on average.

Numerous other studies since have continued to find associations between stress and eroded telomeres (Blackburn & Epel, 2012). Some studies have even demonstrated that stress can begin to erode telomeres in childhood and perhaps even before children are born. For example, childhood exposure to violence (e.g., maternal domestic violence, bullying victimization, and physical maltreatment) was found in one study to accelerate telomere erosion from ages 5 to 10 (Shalev et al., 2013). Another study reported that young adults whose mothers had experienced severe stress during their pregnancy had shorter telomeres than did those whose mothers had stress-free and uneventful pregnancies (Entringer et al., 2011). Further, the corrosive effects of childhood stress on telomeres can extend into young adulthood. In an investigation of over 4,000 U.K. women ages 41–80, adverse experiences during childhood (e.g., physical abuse, being sent away from home, and parent divorce) were associated with shortened telomere length (Surtees et al., 2010), and telomere size decreased as the amount of experienced adversity increased (Figure 13).

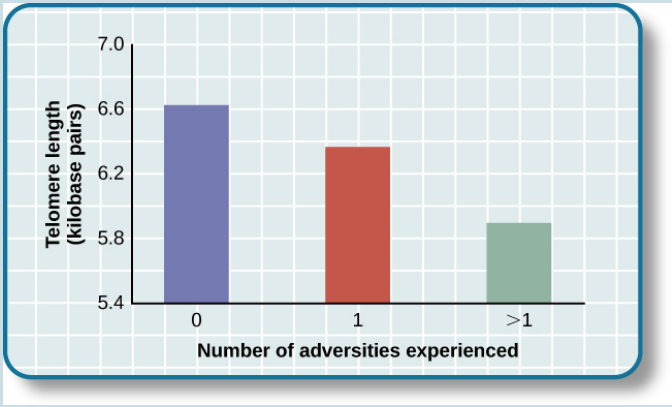

Figure 13. *Telomeres are shorter in adults who experienced more trauma as children (adapted from Blackburn & Epel, 2012).*

Efforts to dissect the precise cellular and physiological mechanisms linking short telomeres to stress and disease are currently underway. For the time being, telomeres provide us with yet another reminder that stress, especially during early life, can be just as harmful to our health as smoking or fast food (Blackburn & Epel, 2012).

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Cardiovascular Disorders

The cardiovascular system is composed of the heart and blood circulation system. For many years, disorders that involve the cardiovascular system—known as **cardiovascular disorders**—have been a major focal point in the study of psychophysiological

disorders because of the cardiovascular system's centrality in the stress response (Everly & Lating, 2002). **Heart disease** is one such condition. Each year, heart disease causes approximately one in three deaths in the United States, and it is the leading cause of death in the developed world (Centers for Disease Control and Prevention [CDC], 2011; Shapiro, 2005).

The symptoms of heart disease vary somewhat depending on the specific kind of heart disease one has, but they generally involve angina—chest pains or discomfort that occur when the heart does not receive enough blood (Office on Women's Health, 2009). The pain often feels like the chest is being pressed or squeezed; burning sensations in the chest and shortness of breath are also commonly reported. Such pain and discomfort can spread to the arms, neck, jaws, stomach (as nausea), and back (American Heart Association [AHA], 2012a) (Figure 3).

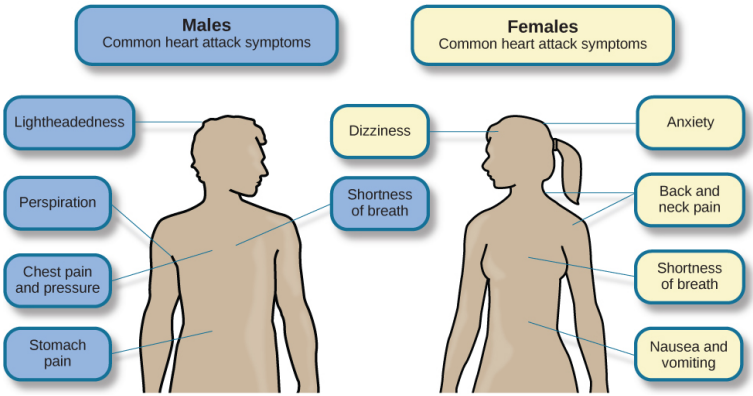

***Figure 14**. Males and females often experience different symptoms of a heart attack.*

A major risk factor for heart disease is **hypertension**, which is high blood pressure. Hypertension forces a person's heart to pump harder, thus putting more physical strain on the heart. If left unchecked, hypertension can lead to a heart attack, stroke, or heart

failure; it can also lead to kidney failure and blindness. Hypertension is a serious cardiovascular disorder, and it is sometimes called the silent killer because it has no symptoms—one who has high blood pressure may not even be aware of it (AHA, 2012b).

Many risk factors contributing to cardiovascular disorders have been identified. These risk factors include social determinants such as aging, income, education, and employment status, as well as behavioral risk factors that include unhealthy diet, tobacco use, physical inactivity, and excessive alcohol consumption; obesity and diabetes are additional risk factors (World Health Organization [WHO], 2013).

Over the past few decades, there has been much greater recognition and awareness of the importance of stress and other psychological factors in cardiovascular health (Nusair, Al-dadah, & Kumar, 2012). Indeed, exposure to stressors of many kinds has also been linked to cardiovascular problems; in the case of hypertension, some of these stressors include job strain (Trudel, Brisson, & Milot, 2010), natural disasters (Saito, Kim, Maekawa, Ikeda, & Yokoyama, 1997), marital conflict (Nealey-Moore, Smith, Uchino, Hawkins, & Olson-Cerny, 2007), and exposure to high traffic noise levels at one's home (de Kluizenaar, Gansevoort, Miedema, & de Jong, 2007). Perceived discrimination appears to be associated with hypertension among African Americans (Sims et al., 2012). In addition, laboratory-based stress tasks, such as performing mental arithmetic under time pressure, immersing one's hand into ice water (known as the cold pressor test), mirror tracing, and public speaking have all been shown to elevate blood pressure (Phillips, 2011).

Are you Type A or Type B?

Sometimes research ideas and theories emerge from seemingly trivial observations. In the 1950s, cardiologist Meyer Friedman was

looking over his waiting room furniture, which consisted of upholstered chairs with armrests. Friedman decided to have these chairs reupholstered. When the man doing the reupholstering came to the office to do the work, he commented on how the chairs were worn in a unique manner—the front edges of the cushions were worn down, as were the front tips of the arm rests. It seemed like the cardiology patients were tapping or squeezing the front of the armrests, as well as literally sitting on the edge of their seats (Friedman & Rosenman, 1974). Were cardiology patients somehow different than other types of patients? If so, how?

After researching this matter, Friedman and his colleague, Ray Rosenman, came to understand that people who are prone to heart disease tend to think, feel, and act differently than those who are not. These individuals tend to be intensively driven workaholics who are preoccupied with deadlines and always seem to be in a rush. According to Friedman and Rosenman, these individuals exhibit **Type A** behavior pattern; those who are more relaxed and laid-back were characterized as **Type B** (Figure 4). In a sample of Type As and Type Bs, Friedman and Rosenman were startled to discover that heart disease was over seven times more frequent among the Type As than the Type Bs (Friedman & Rosenman, 1959).

(a) (b)

Figure 15. *(a) Type A individuals are characterized as intensely driven, (b) while Type B people are characterized as laid-back and relaxed. (credit a: modification of work by Greg Hernandez; credit b: modification of work by Elvert Barnes)*

The major components of the Type A pattern include an aggressive and chronic struggle to achieve more and more in less and less time (Friedman & Rosenman, 1974). Specific characteristics of the Type A pattern include an excessive competitive drive, chronic sense of time urgency, impatience, and hostility toward others (particularly those who get in the person's way).

An example of a person who exhibits Type A behavior pattern is Jeffrey. Even as a child, Jeffrey was intense and driven. He excelled

at school, was captain of the swim team, and graduated with honors from an Ivy League college. Jeffrey never seems able to relax; he is always working on something, even on the weekends. However, Jeffrey always seems to feel as though there are not enough hours in the day to accomplish all he feels he should. He volunteers to take on extra tasks at work and often brings his work home with him; he often goes to bed angry late at night because he feels that he has not done enough. Jeffrey is quick tempered with his coworkers; he often becomes noticeably agitated when dealing with those coworkers he feels work too slowly or whose work does not meet his standards. He typically reacts with hostility when interrupted at work. He has experienced problems in his marriage over his lack of time spent with family. When caught in traffic during his commute to and from work, Jeffrey incessantly pounds on his horn and swears loudly at other drivers. When Jeffrey was 52, he suffered his first heart attack.

By the 1970s, a majority of practicing cardiologists believed that Type A behavior pattern was a significant risk factor for heart disease (Friedman, 1977). Indeed, a number of early longitudinal investigations demonstrated a link between Type A behavior pattern and later development of heart disease (Rosenman et al., 1975; Haynes, Feinleib, & Kannel, 1980).

Subsequent research examining the association between Type A and heart disease, however, failed to replicate these earlier findings (Glassman, 2007; Myrtek, 2001). Because Type A theory did not pan out as well as they had hoped, researchers shifted their attention toward determining if any of the specific elements of Type A predict heart disease.

Extensive research clearly suggests that the anger/hostility dimension of Type A behavior pattern may be one of the most important factors in the development of heart disease. This relationship was initially described in the Haynes et al. (1980) study mentioned above: Suppressed hostility was found to substantially elevate the risk of heart disease for both men and women. Also, one investigation followed over 1,000 male medical students from 32 to 48 years. At the beginning of the study, these men completed a

questionnaire assessing how they react to pressure; some indicated that they respond with high levels of **anger**, whereas others indicated that they respond with less anger. Decades later, researchers found that those who earlier had indicated the highest levels of anger were over 6 times more likely than those who indicated less anger to have had a heart attack by age 55, and they were 3.5 times more likely to have experienced heart disease by the same age (Chang, Ford, Meoni, Wang, & Klag, 2002). From a health standpoint, it clearly does not pay to be an angry young person.

After reviewing and statistically summarizing 35 studies from 1983 to 2006, Chida and Steptoe (2009) concluded that the bulk of the evidence suggests that anger and hostility constitute serious long-term risk factors for adverse cardiovascular outcomes among both healthy individuals and those already suffering from heart disease. One reason angry and hostile moods might contribute to cardiovascular diseases is that such moods can create social strain, mainly in the form of antagonistic social encounters with others. This strain could then lay the foundation for disease-promoting cardiovascular responses among hostile individuals (Vella, Kamarck, Flory, & Manuck, 2012). In this transactional model, hostility and social strain form a cycle (Figure 5).

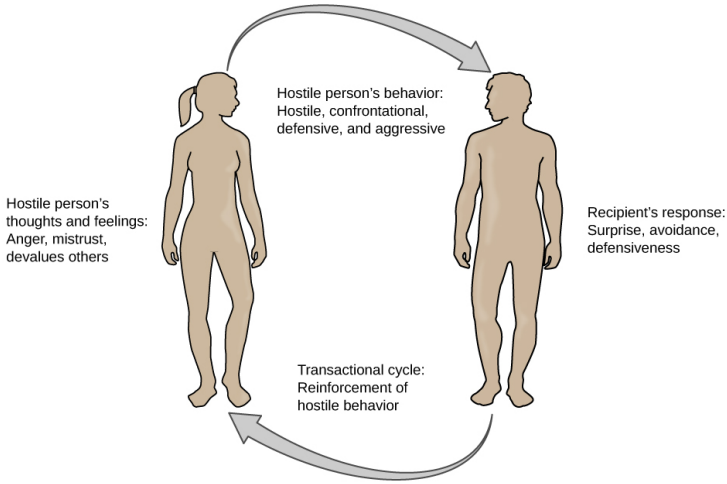

Figure 16. *According to the transactional model of hostility for predicting social interactions (Vella et al., 2012), the thoughts and feelings of a hostile person promote antagonistic behavior toward others, which in turn reinforces complimentary reactions from others, thereby intensifying ones' hostile disposition and intensifying the cyclical nature of this relationship.*

For example, suppose Kaitlin has a hostile disposition; she has a cynical, distrustful attitude toward others and often thinks that other people are out to get her. She is very defensive around people, even those she has known for years, and she is always looking for signs that others are either disrespecting or belittling her. In the shower each morning before work, she often mentally rehearses what she would say to someone who said or did something that angered her, such as making a political statement that was counter to her own ideology. As Kaitlin goes through these mental rehearsals, she often grins and thinks about the retaliation on anyone who will irk her that day.

Socially, she is confrontational and tends to use a harsh tone with people, which often leads to very disagreeable and sometimes argumentative social interactions. As you might imagine, Kaitlin is not especially popular with others, including coworkers, neighbors,

and even members of her own family. They either avoid her at all costs or snap back at her, which causes Kaitlin to become even more cynical and distrustful of others, making her disposition even more hostile. Kaitlin's hostility—through her own doing—has created an antagonistic environment that cyclically causes her to become even more hostile and angry, thereby potentially setting the stage for cardiovascular problems.

In addition to anger and hostility, a number of other negative emotional states have been linked with heart disease, including negative affectivity and depression (Suls & Bunde, 2005). **Negative affectivity** is a tendency to experience distressed emotional states involving anger, contempt, disgust, guilt, fear, and nervousness (Watson, Clark, & Tellegen, 1988). It has been linked with the development of both hypertension and heart disease. For example, over 3,000 initially healthy participants in one study were tracked longitudinally, up to 22 years. Those with higher levels of negative affectivity at the time the study began were substantially more likely to develop and be treated for hypertension during the ensuing years than were those with lower levels of negative affectivity (Jonas & Lando, 2000). In addition, a study of over 10,000 middle-aged London-based civil servants who were followed an average of 12.5 years revealed that those who earlier had scored in the upper third on a test of negative affectivity were 32% more likely to have experienced heart disease, heart attack, or angina over a period of years than were those who scored in the lowest third (Nabi, Kivimaki, De Vogli, Marmot, & Singh-Manoux, 2008). Hence, negative affectivity appears to be a potentially vital risk factor for the development of cardiovascular disorders.

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Coping with Stress

As you learned in the previous section, stress—especially if it is chronic—takes a toll on our bodies and can have enormously negative health

implications. When we experience events in our lives that we appraise as stressful, it is essential that we use effective coping strategies to manage our stress. Coping refers to mental and behavioral efforts that we use to deal with problems relating to stress, including its presumed cause and the unpleasant feelings and emotions it produces.

Happiness is conceptualized as an enduring state of mind that consists of the capacity to experience pleasure in daily life, as well as the ability to engage one's skills and talents to enrich one's life and the lives of others. Although people around the world generally report that they are happy, there are differences in average happiness levels across nations. Although people have a tendency to overestimate the extent to which their happiness set points would change for the better or for the worse following certain life events, researchers have identified a number of factors that are consistently related to happiness. In recent years, positive psychology has emerged as an area of study seeking to identify and promote qualities that lead to greater happiness and fulfillment in our lives. These components include positive affect, optimism, and flow.

Coping Styles

Lazarus and Folkman (1984) distinguished two fundamental kinds of coping: problem-focused coping and emotion-focused coping. In problem-focused coping, one attempts to manage or alter the problem that is causing one to experience stress (i.e., the stressor). **Problem-focused coping** strategies are similar to strategies used in everyday problem-solving: they typically involve identifying the problem, considering possible solutions, weighing the costs and benefits of these solutions, and then selecting an alternative (Lazarus & Folkman, 1984). As an example, suppose Bradford receives a midterm notice that he is failing statistics class. If Bradford adopts a problem-focused coping approach to managing

his stress, he would be proactive in trying to alleviate the source of the stress. He might contact his professor to discuss what must be done to raise his grade, he might also decide to set aside two hours daily to study statistics assignments, and he may seek tutoring assistance. A problem-focused approach to managing stress means we actively try to do things to address the problem.

Emotion-focused coping, in contrast, consists of efforts to change or reduce the negative emotions associated with stress. These efforts may include avoiding, minimizing, or distancing oneself from the problem, or positive comparisons with others ("I'm not as bad off as she is"), or seeking something positive in a negative event ("Now that I've been fired, I can sleep in for a few days"). In some cases, emotion-focused coping strategies involve reappraisal, whereby the stressor is construed differently (and somewhat self-deceptively) without changing its objective level of threat (Lazarus & Folkman, 1984). For example, a person sentenced to federal prison who thinks, "This will give me a great chance to network with others," is using reappraisal. If Bradford adopted an emotion-focused approach to managing his midterm deficiency stress, he might watch a comedy movie, play video games, or spend hours on Twitter to take his mind off the situation. In a certain sense, emotion-focused coping can be thought of as treating the symptoms rather than the actual cause.

While many stressors elicit both kinds of coping strategies, problem-focused coping is more likely to occur when encountering stressors we perceive as controllable, while emotion-focused coping is more likely to predominate when faced with stressors that we believe we are powerless to change (Folkman & Lazarus, 1980). Clearly, emotion-focused coping is more effective in dealing with uncontrollable stressors. For example, if at midnight you are stressing over a 40-page paper due in the morning that you have not yet started, you are probably better off recognizing the hopelessness of the situation and doing something to take your mind off it; taking a problem-focused approach by trying to

accomplish this task would only lead to frustration, anxiety, and even more stress.

Fortunately, most stressors we encounter can be modified and are, to varying degrees, controllable. A person who cannot stand her job can quit and look for work elsewhere; a middle-aged divorcee can find another potential partner; the freshman who fails an exam can study harder next time, and a breast lump does not necessarily mean that one is fated to die of breast cancer.

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Defense Mechanisms

Freud believed that feelings of anxiety result from the ego's inability to mediate the conflict between the id and superego. When this happens, Freud believed that the ego seeks to restore balance through various protective measures known as **defense mechanisms** (Figure 6). When certain events, feelings, or yearnings cause an individual anxiety, the individual wishes to reduce that anxiety. To do that, the individual's unconscious mind uses ego defense mechanisms, unconscious protective behaviors that aim to reduce anxiety. The ego, usually conscious, resorts to unconscious strivings to protect the ego from being overwhelmed by anxiety. When we use defense mechanisms, we are unaware that we are using them. Further, they operate in various ways that distort reality. According to Freud, we all use ego defense mechanisms.

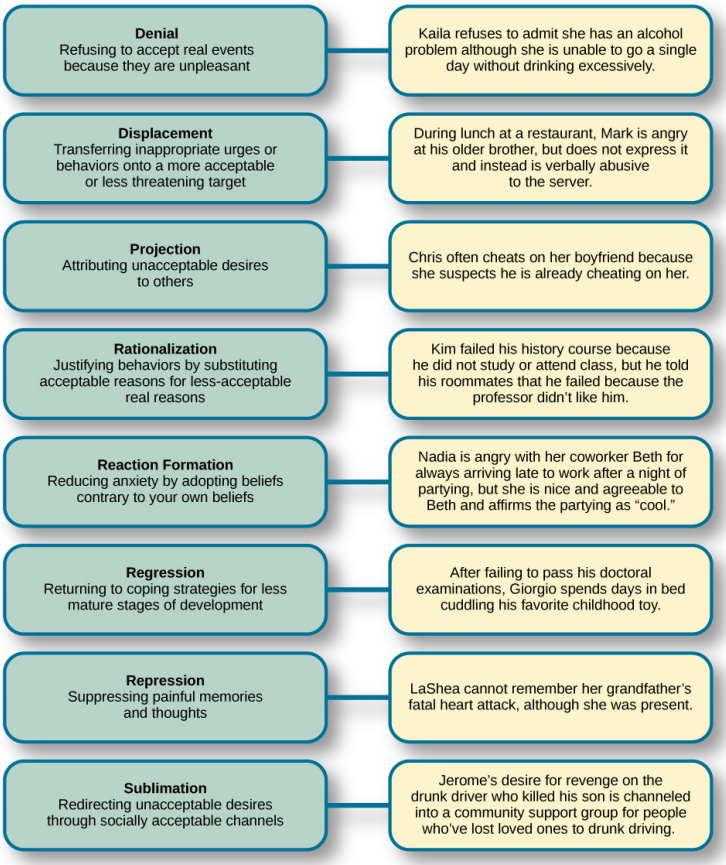

Figure 17*. Defense mechanisms are unconscious protective behaviors that work to reduce anxiety.*

While everyone uses defense mechanisms, Freud believed that overuse of them may be problematic. For example, let's say Joe Smith is a high school football player. Deep down, Joe feels sexually attracted to males. His conscious belief is that being gay is immoral and that if he were gay, his family would disown him and he would be ostracized by his peers. Therefore, there is a conflict between his conscious beliefs (being gay is wrong and will result in being

ostracized) and his unconscious urges (attraction to males). The idea that he might be gay causes Joe to have feelings of anxiety. How can he decrease his anxiety? Joe may find himself acting very "macho," making gay jokes, and picking on a school peer who is gay. This way, Joe's unconscious impulses are further submerged.

There are several different types of defense mechanisms. For instance, in repression, anxiety-causing memories from consciousness are blocked. As an analogy, let's say your car is making a strange noise, but because you do not have the money to get it fixed, you just turn up the radio so that you no longer hear the strange noise. Eventually you forget about it. Similarly, in the human psyche, if a memory is too overwhelming to deal with, it might be **repressed** and thus removed from conscious awareness (Freud, 1920). This repressed memory might cause symptoms in other areas.

Another defense mechanism is **reaction formation**, in which someone expresses feelings, thoughts, and behaviors opposite to their inclinations. In the above example, Joe made fun of a homosexual peer while himself being attracted to males. In **regression**, an individual acts much younger than their age. For example, a four-year-old child who resents the arrival of a newborn sibling may act like a baby and revert to drinking out of a bottle. In **projection**, a person refuses to acknowledge her own unconscious feelings and instead sees those feelings in someone else. Other defense mechanisms include **rationalization**, **displacement**, and **sublimation**.

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Control and Stress

The desire and ability to predict events, make decisions, and affect outcomes—that is, to enact control in our lives—is a basic tenet of human behavior (Everly & Lating, 2002). Albert Bandura (1997) stated that "the intensity and chronicity of human stress is governed largely by perceived control over the demands of one's life" (p. 262). As cogently described in his statement, our reaction to potential stressors depends to a large extent on how much control we feel we have over such things. **Perceived control** is our beliefs about our personal capacity to exert influence over and shape outcomes, and it has major implications for our health and happiness (Infurna & Gerstorf, 2014). Extensive research has demonstrated that perceptions of personal control are associated with a variety of favorable outcomes, such as better physical and mental health and

greater psychological well-being (Diehl & Hay, 2010). Greater personal control is also associated with lower reactivity to stressors in daily life. For example, researchers in one investigation found that higher levels of perceived control at one point in time were later associated with lower emotional and physical reactivity to interpersonal stressors (Neupert, Almeida, & Charles, 2007). Further, a daily diary study with 34 older widows found that their stress and anxiety levels were significantly reduced on days during which the widows felt greater perceived control (Ong, Bergeman, & Bisconti, 2005).

The link between perceived control and health may provide an explanation for the frequently observed relationship between social class and health outcomes (Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012). In general, research has found that more affluent individuals experience better health mainly because they tend to believe that they can personally control and manage their reactions to life's stressors (Johnson & Krueger, 2006). Perhaps buoyed by the perceived level of control, individuals of higher social class may be prone to overestimating the degree of influence they have over particular outcomes. For example, those of higher social class tend to believe that their votes have greater sway on election outcomes than do those of lower social class, which may explain higher rates of voting in more affluent communities (Krosnick, 1990). Other research has found that a sense of perceived control can protect less affluent individuals from poorer health, depression, and reduced life-satisfaction—all of which tend to accompany lower social standing (Lachman & Weaver, 1998).

Taken together, findings from these and many other studies clearly suggest that perceptions of control and coping abilities are important in managing and coping with the stressors we encounter throughout life.

Try It

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Social Support

The need to form and maintain strong, stable relationships with others is a powerful, pervasive, and fundamental human motive (Baumeister & Leary, 1995). Building strong interpersonal relationships with others helps us establish a network of close,

caring individuals who can provide social support in times of distress, sorrow, and fear. **Social support** can be thought of as the soothing impact of friends, family, and acquaintances (Baron & Kerr, 2003). Social support can take many forms, including advice, guidance, encouragement, acceptance, emotional comfort, and tangible assistance (such as financial help). Thus, other people can be very comforting to us when we are faced with a wide range of life stressors, and they can be extremely helpful in our efforts to manage these challenges. Even in nonhuman animals, species mates can offer social support during times of stress. For example, elephants seem to be able to sense when other elephants are stressed and will often comfort them with physical contact—such as a trunk touch—or an empathetic vocal response (Krumboltz, 2014).

Scientific interest in the importance of social support first emerged in the 1970s when health researchers developed an interest in the health consequences of being socially integrated (Stroebe & Stroebe, 1996). Interest was further fueled by longitudinal studies showing that social connectedness reduced mortality. In one classic study, nearly 7,000 Alameda County, California, residents were followed over 9 years. Those who had previously indicated that they lacked social and community ties were more likely to die during the follow-up period than those with more extensive social networks. Compared to those with the most social contacts, isolated men and women were, respectively, 2.3 and 2.8 times more likely to die. These trends persisted even after controlling for a variety of health-related variables, such as smoking, alcohol consumption, self-reported health at the beginning of the study, and physical activity (Berkman & Syme, 1979).

Since the time of that study, social support has emerged as one of the well-documented psychosocial factors affecting health outcomes (Uchino, 2009). A statistical review of 148 studies conducted between 1982 and 2007 involving over 300,000 participants concluded that individuals with stronger social relationships have a 50% greater likelihood of survival compared to those with weak or insufficient social relationships (Holt-Lunstad,

Smith, & Layton, 2010). According to the researchers, the magnitude of the effect of social support observed in this study is comparable with quitting smoking and exceeded many well-known risk factors for mortality, such as obesity and physical inactivity.

(a)

(b)

Figure 18. *Close relationships with others, whether (a) a group of friends or (b) a family circle, provide more than happiness and fulfillment—they can help foster good health. (credit a: modification of work by Nattachai Noogure; credit b: modification of work by Christian Haugen)*

A number of large-scale studies have found that individuals with low levels of social support are at greater risk of mortality, especially from cardiovascular disorders (Brummett et al., 2001). Further, higher levels of social supported have been linked to better survival rates following breast cancer (Falagas et al., 2007) and infectious diseases, especially HIV infection (Lee & Rotheram-Borus, 2001). In fact, a person with high levels of social support is less likely to contract a common cold. In one study, 334 participants completed questionnaires assessing their sociability; these individuals were subsequently exposed to a virus that causes a common cold and monitored for several weeks to see who became ill. Results showed that increased sociability was linearly associated with a decreased probability of developing a cold (Cohen, Doyle, Turner, Alper, & Skoner, 2003).

For many of us, friends are a vital source of social support. But what if you found yourself in a situation in which you lacked friends or companions? For example, suppose a popular high school

student attends a far-away college, does not know anyone, and has trouble making friends and meaningful connections with others during the first semester. What can be done? If real life social support is lacking, access to distant friends via social media may help compensate. In a study of college freshmen, those with few face-to-face friends on campus but who communicated electronically with distant friends were less distressed that those who did not (Raney & Troop-Gordon, 2012). Also, for some people, our families—especially our parents—are a major source of social support.

Social support appears to work by boosting the immune system, especially among people who are experiencing stress (Uchino, Vaughn, Carlisle, & Birmingham, 2012). In a pioneering study, spouses of cancer patients who reported high levels of social support showed indications of better immune functioning on two out of three immune functioning measures, compared to spouses who were below the median on reported social support (Baron, Cutrona, Hicklin, Russell, & Lubaroff, 1990). Studies of other populations have produced similar results, including those of spousal caregivers of dementia sufferers, medical students, elderly adults, and cancer patients (Cohen & Herbert, 1996; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002).

In addition, social support has been shown to reduce blood pressure for people performing stressful tasks, such as giving a speech or performing mental arithmetic (Lepore, 1998). In these kinds of studies, participants are usually asked to perform a stressful task either alone, with a stranger present (who may be either supportive or unsupportive), or with a friend present. Those tested with a friend present generally exhibit lower blood pressure than those tested alone or with a stranger (Fontana, Diegnan, Villeneuve, & Lepore, 1999). In one study, 112 female participants who performed stressful mental arithmetic exhibited lower blood pressure when they received support from a friend rather than a stranger, but only if the friend was a male (Phillips, Gallagher, & Carroll, 2009). Although these findings are somewhat difficult to interpret, the

authors mention that it is possible that females feel less supported and more evaluated by other females, particularly females whose opinions they value.

Taken together, the findings above suggest one of the reasons social support is connected to favorable health outcomes is because it has several beneficial physiological effects in stressful situations. However, it is also important to consider the possibility that social support may lead to better health behaviors, such as a healthy diet, exercising, smoking cessation, and cooperation with medical regimens (Uchino, 2009).

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Stress Reduction Techniques

Beyond having a sense of control and establishing social support networks, there are numerous other means by which we can manage stress. A common technique people use to combat stress is **exercise** (Salmon, 2001). It is well-established that exercise, both of long (aerobic) and short (anaerobic) duration, is beneficial for both physical and mental health (Everly & Lating, 2002). There is considerable evidence that physically fit individuals are more resistant to the adverse effects of stress and recover more quickly from stress than less physically fit individuals (Cotton, 1990). In a study of more than 500 Swiss police officers and emergency service personnel, increased physical fitness was associated with reduced stress, and regular exercise was reported to protect against stress-related health problems (Gerber, Kellman, Hartman, & Pühse, 2010).

(a) (b) (c)

Figure 19*. Stress reduction techniques may include (a) exercise, (b) meditation and relaxation, or (c) biofeedback. (credit a: modification of work by "UNE Photos"/Flickr; credit b: modification of work by Caleb Roenigk; credit c: modification of work by Dr. Carmen Russoniello)*

One reason exercise may be beneficial is because it might buffer some of the deleterious physiological mechanisms of stress. One study found rats that exercised for six weeks showed a decrease in hypothalamic-pituitary-adrenal responsiveness to mild stressors (Campeau et al., 2010). In high-stress humans, exercise has been shown to prevent telomere shortening, which may explain the common observation of a youthful appearance among those who exercise regularly (Puterman et al., 2010). Further, exercise in later adulthood appears to minimize the detrimental effects of stress on the hippocampus and memory (Head, Singh, & Bugg, 2012). Among cancer survivors, exercise has been shown to reduce anxiety (Speck, Courneya, Masse, Duval, & Schmitz, 2010) and depressive symptoms

(Craft, VanIterson, Helenowski, Rademaker, & Courneya, 2012). Clearly, exercise is a highly effective tool for regulating stress.

In the 1970s, Herbert Benson, a cardiologist, developed a stress reduction method called the **relaxation response technique** (Greenberg, 2006). The relaxation response technique combines relaxation with transcendental **meditation**, and consists of four components (Stein, 2001): sitting upright on a comfortable chair with feet on the ground and body in a relaxed position, a quiet environment with eyes closed, repeating a word or a phrase—a mantra—to oneself, such as "alert mind, calm body," passively allowing the mind to focus on pleasant thoughts, such as nature or the warmth of your blood nourishing your body.

The relaxation response approach is conceptualized as a general approach to stress reduction that reduces sympathetic arousal, and it has been used effectively to treat people with high blood pressure (Benson & Proctor, 1994).

Another technique to combat stress, **biofeedback**, was developed by Gary Schwartz at Harvard University in the early 1970s. Biofeedback is a technique that uses electronic equipment to accurately measure a person's neuromuscular and autonomic activity—feedback is provided in the form of visual or auditory signals. The main assumption of this approach is that providing somebody biofeedback will enable the individual to develop strategies that help gain some level of voluntary control over what are normally involuntary bodily processes (Schwartz & Schwartz, 1995). A number of different bodily measures have been used in biofeedback research, including facial muscle movement, brain activity, and skin temperature, and it has been applied successfully with individuals experiencing tension headaches, high blood pressure, asthma, and phobias (Stein, 2001).

Physical Development in Early Adulthood

In this section, we will see how young adults are often at their peak physically, sexually, and in terms of health and reproduction; yet they are also particularly at risk for injury, violence, substance abuse, sexually transmitted diseases, and more. As you read, consider whether or not you think young adults are in the prime of their lives.

Figure 1. *How old do you think this group of young adults are? What clues can you use to help you estimate their age?*

Before we dive into the specific physical changes and experiences of early adulthood, let's consider the key developmental tasks during this time—the ages between 18 and 40. The beginning of early adulthood, ages 18-25, is sometimes considered its own phase, emerging adulthood, but the developmental tasks that are the focus during emerging adulthood persist throughout the early adulthood years. Look at the list below and try to think of someone you know between 18 and 40 who fits each of the descriptions.

Developmental Tasks of Early Adulthood

Havighurst (1972) describes some of the developmental tasks of young adults. These include:

1. Achieving autonomy: trying to establish oneself as an

independent person with a life of one's own

2. Establishing identity: more firmly establishing likes, dislikes, preferences, and philosophies
3. Developing emotional stability: becoming more stable emotionally which is considered a sign of maturing
4. Establishing a career: deciding on and pursuing a career or at least an initial career direction and pursuing an education
5. Finding intimacy: forming first close, long-term relationships
6. Becoming part of a group or community: young adults may, for the first time, become involved with various groups in the community. They may begin voting or volunteering to be part of civic organizations (scouts, church groups, etc.). This is especially true for those who participate in organizations as parents.
7. Establishing a residence and learning how to manage a household: learning how to budget and keep a home maintained.
8. Becoming a parent and rearing children: learning how to manage a household with children.
9. Making marital or relationship adjustments and learning to parent.

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Think It Over

To what extent do you think these early adulthood developmental tasks have changed in the last several years? How might these tasks vary by culture?

Physical Development in Early Adulthood

The Physiological Peak

Figure 2*. Early adulthood is generally a time of peak physical health.*

People in their twenties and thirties are considered young adults. If you are in your early twenties, you are probably at the peak of your physiological development. Your body has completed its growth, though your brain is still developing (as explained in the previous module on adolescence). Physically, you are in the "prime of your life" as your reproductive system, motor ability, strength, and lung capacity are operating at their best. However, these systems will start a slow, gradual decline so that by the time you reach your mid to late 30s, you will begin to notice signs of aging. This includes a decline in your immune system, your response time, and in your ability to recover quickly from physical exertion. For example, you may have noticed that it takes you quite some time to stop panting after running to class or taking the stairs. But, remember that both nature and nurture continue to influence development. Getting out of shape is not an inevitable part of aging; it is probably due to the fact that you have become less physically active and have experienced greater stress. The good news is that there are things you can do to combat many of these changes. So keep in mind, as we continue to discuss the lifespan, that some of the changes we associate with aging can be prevented or turned around if we adopt healthier lifestyles.

In fact, research shows that the habits we establish in our twenties are related to certain health conditions in middle age, particularly the risk of heart disease. What are healthy habits that

young adults can establish now that will prove beneficial in later life? Healthy habits include maintaining a lean body mass index, moderate alcohol intake, a smoke-free lifestyle, a healthy diet, and regular physical activity. When experts were asked to name one thing they would recommend young adults do to facilitate good health, their specific responses included: weighing self often, learning to cook, reducing sugar intake, developing an active lifestyle, eating vegetables, practicing portion control, establishing an exercise routine (especially a "post-party" routine, if relevant), and finding a job you love.

Being overweight or obese is a real concern in early adulthood. Medical research shows that American men and women with moderate weight gain from early to middle adulthood have significantly increased risks of major chronic disease and mortality (Zheng, et al, 2017). Given the fact that American men and women tend to gain about one to two pounds per year from early to middle adulthood, developing healthy nutrition and exercise habits across adulthood is important (Nichols, 2017).

Watch It

This video explains how the brain continues to develop into adulthood.

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A Healthy, but Risky Time

Early adulthood tends to be a time of relatively good health. For instance, in the United States, adults ages 18-44 have the lowest percentage of physician office visits than any other age group, younger or older. However, early adulthood seems to be a particularly risky time for violent deaths (rates vary by gender, race, and ethnicity). The leading causes of death for both age groups 15-24 and 25-34 in the U.S. are unintentional injury, suicide, and homicide. Cancer and heart disease follow as the fourth and fifth top causes of death among young adults (Centers for Disease Control and Prevention, 2019).

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Substance Abuse

Rates of violent death are influenced by substance abuse, which peaks during early adulthood. Some young adults use drugs and alcohol as a way of coping with stress from family, personal relationships, or concerns over being on one's own. Others "use" because they have friends who use and in the early 20s, there is still a good deal of pressure to conform. Youth transitioning into adulthood have some of the highest rates of alcohol and substance abuse. For instance, rates of binge drinking (drinking five or more drinks on a single occasion) in 2014 were: 28.5 percent for people ages 18 to 20 and 43.3 percent for people ages 21-25. Recent data from the Centers for Disease Control and Prevention show increases in drug overdose deaths between 2006 and 2016 (with higher rates among males), but with the steepest increases between

2014 and 2016 occurring among males aged 24-34 and females aged 24-34 and 35-44. Rates vary by other factors including race and geography; increased use and abuse of opioids may also play a role.

Watch It

To learn more about opioid drugs and the current opioid crisis, please watch the following video:

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Drugs impair judgment, reduce inhibitions, and alter mood, all of which can lead to dangerous behavior. Reckless driving, violent altercations, and forced sexual encounters are some examples. College campuses are notorious for binge drinking, which is particularly concerning since alcohol plays a role in over half of all student sexual assaults. Alcohol is involved nearly 90 percent of the time in acquaintance rape (when the perpetrator knows the victim). Over 40 percent of sexual assaults involve alcohol use by the victim and almost 70 percent involve alcohol use by the perpetrator.

Link to Learning

After she was the victim of an assault in London, college student Ione Wells published a letter to her attacker in a student newspaper that went viral and sparked the #NotGuilty campaign against sexual violence and victim-blaming. Watch Ione Wells' TED talk "How We Talk About Sexual Assault Online" to learn more [Note: this is a sensitive topic.]

Drug and alcohol use increase the risk of sexually transmitted infections because people are more likely to engage in risky sexual behavior when under the influence. This includes having sex with someone who has had multiple partners, having anal sex without the use of a condom, having multiple partners, or having sex with someone whose history is unknown. Such risky sexual behavior puts individuals at increased risk for both sexually transmitted diseases (STDs) and human immunodeficiency virus (HIV). STDs are especially common among young people. There are about 20 million new cases of STDs each year in the United States and about half of those infections are in people between the ages of 15 and 24. Also, young people are the most likely to be unaware of their HIV infection, with half not knowing they have the virus (Centers for Disease Control and Prevention, 2019).

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Sex and Fertility in Early Adulthood

Sexual Responsiveness and Reproduction in Early Adulthood

Sexual Responsiveness

Men and women tend to reach their peak of sexual responsiveness at different ages. For men, sexual responsiveness tends to peak in the late teens and early twenties. Sexual arousal can easily occur in response to physical stimulation or fantasizing. Sexual responsiveness begins a slow decline in the late twenties and into

the thirties although a man may continue to be sexually active throughout adulthood. Over time, a man may require more intense stimulation in order to become aroused. Women often find that they become more sexually responsive throughout their 20s and 30s and may peak in the late 30s or early 40s. This is likely due to greater self-confidence and reduced inhibitions about sexuality.

There are a wide variety of factors that influence sexual relationships during emerging adulthood; this includes beliefs about certain sexual behaviors and marriage. For example, among emerging adults in the United States, it is common for oral sex to not be considered "real sex". In the 1950s and 1960s, about 75 percent of people between the ages of 20–24 engaged in premarital sex; today, that number is 90 percent. Unintended pregnancy and sexually transmitted infections and diseases (STIs/STDs) are a central issue. As individuals move through emerging adulthood, they are more likely to engage in monogamous sexual relationships and practice safe sex.

Reproduction

For many couples, early adulthood is the time for having children. However, delaying childbearing until the late 20s or early 30s has become more common in the United States. The mean age of first-time mothers in the United States increased 1.4 years, from 24.9 in 2000 to 26.3 in 2014. This shift can primarily be attributed to a larger number of first births to older women along with fewer births to mothers under age 20 (CDC, 2016).

Couples delay childbearing for a number of reasons. Women are now more likely to attend college and begin careers before starting families. And both men and women are delaying marriage until they are in their late 20s and early 30s. In 2018, the average age for a first marriage in the United States was 29.8 for men and 27.8 for women.

Infertility

Infertility affects about 6.7 million women or 11 percent of the reproductive age population (American Society of Reproductive Medicine [ASRM], 2006-2010. Male factors create infertility in about a third of the cases. For men, the most common cause is a lack of sperm production or low sperm production. Female factors cause infertility in another third of cases. For women, one of the most common causes of infertility is ovulation disorder. Other causes of female infertility include blocked fallopian tubes, which can occur when a woman has had **pelvic inflammatory disease (PID)** or **endometriosis**. PID is experienced by 1 out of 7 women in the United States and leads to infertility about 20 percent of the time. One of the major causes of PID is **Chlamydia**, the most commonly diagnosed sexually transmitted infection in young women. Another cause of pelvic inflammatory disease is **gonorrhea**. Both male and female factors contribute to the remainder of cases of infertility and approximately 20 percent are unexplained.

Watch It

Watch this video to learn more about the reasons for infertility and the main treatment methods available for conceiving.

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Fertility Treatment

The majority of infertility cases (85-90 percent) are treated using fertility drugs to increase ovulation or with surgical procedures to repair the reproductive organs or remove scar tissue from the reproductive tract. **In vitro fertilization (IVF)** is used to treat infertility in less than 5 percent of cases. IVF is used when a woman has blocked or deformed fallopian tubes or sometimes when a man has a very low sperm count. This procedure involves removing eggs from the female and fertilizing the eggs outside the woman's body. The fertilized egg is then reinserted in the woman's uterus. The average cost of an IVF cycle in the U.S. is $10,000-15,000 and the average live delivery rate for IVF in 2005 was 31.6 percent per retrieval. IVF makes up about 99 percent of artificial reproductive procedures. [ASRM, 2006-2010]

Less common procedures include **gamete intrafallopian tube transfer (GIFT)** which involves implanting both sperm and ova into the fallopian tube and fertilization is allowed to occur naturally. **Zygote intrafallopian tube transfer (ZIFT)** is another procedure in which sperm and ova are fertilized outside of the woman's body and the fertilized egg or zygote is then implanted in the fallopian tube. This allows the zygote to travel down the fallopian tube and embed in the lining of the uterus naturally.

Insurance coverage for infertility is required in fourteen states,

but the amount and type of coverage available vary greatly (ASRM, 2006-2010). The majority of couples seeking treatment for infertility pay much of the cost. Consequently, infertility treatment is much more accessible to couples with higher incomes. However, grants and funding sources may be available for lower-income couples seeking infertility treatment.

Fertility for Singles and Same-Sex Couples

The journey to parenthood may look different for singles same-sex couples. However, there are several viable options available to them to have their own biological children. Men and women may choose to donate their sperm or eggs to help others reproduce for monetary or humanitarian reasons. Some gay couples may decide to have a surrogate pregnancy. One or both of the men would provide the sperm and choose a carrier. The chosen woman may be the source of the egg and uterus or the woman could be a third party that carries the created embryo.

Reciprocal IVF is used by couples who both possess female reproductive organs. Using in vitro fertilization, eggs are removed from one partner to be used to make embryos that the other partner will hopefully carry in a successful pregnancy.

Artificial insemination (AI) is the deliberate introduction of sperm into a female's cervix or uterine cavity for the purpose of achieving a pregnancy through in vivo fertilization by means other than sexual intercourse. AI is most often used by single women who desire to give birth to their own child, women who are in a lesbian relationship, or women who are in a heterosexual relationship but with a male partner who is infertile or who has a physical impairment which prevents intercourse. The sperm used could be anonymous or from a known donor.

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Physical Development in Middle Adulthood

Hippocrates (author of the famous "Hippocratic oath") was of the opinion that "walking is the best medicine." This was his learned opinion in 400 BCE and there is now considerable, and increasing, evidence that he may have been correct.

As we will see, there are simple physiological changes that accompany middle adulthood. These are somewhat inevitable, but the importance of physical activity at this age range would be difficult to overstate looking at the evidence. Exercise does not necessarily mean running marathons, it may simply mean a commitment to using your legs in a brisk fashion for thirty minutes. "Use it or lose it" is a good mantra for this stage of development—the technical term for the the loss of muscle tissue and function as we age is sarcopenia. From age 30, the body loses 3-8% of its muscle mass per decade, and this accelerates after the age of 60 (Volpi et al, 2010). Diet and exercise can ameliorate both the extent and lifestyle consequences of these kinds of processes. In this section, we will examine some of the changes associated with middle adulthood and consider how they impact human life.

Physical Mobility in Middle Adulthood

***Figure 1**. Exercise during middle adulthood is important not only for the body, but for the brain.*

The importance of not succumbing to the temptations of a sedentary lifestyle was as obvious to Hippocrates in 400 BCE as it is now. Piasecki et al (2018) are of the opinion that **sarcopenia** (loss of muscle tissue and function as we age) in legs might be the result of leg muscles becoming detached from the nervous system. Further, Piasescki et al (2018) believe that exercise encourages new nerve growth slowing the progression of sarcopenia. Persons aged 75 may have up to 30-60% fewer nerve endings in their leg muscles than they did in their early 20s.

Sarcopenia has only recently been recognized an independent disease entity since 2016 (ICD-10). In 2018 the U.S. Center for Disease Control and prevention assigned sarcopenia its own discrete medical code. Disease entities that affect mobility will become an increasingly costly phenomenon, and will affect the quality of life of millions of people as the population ages. In many ways it is a natural phenomenon, and many doctors and researchers have been reticent to overly pathologize natural changes associated with age. However, mobility is now becoming a central concern, and some researchers are now identifying some conditions like **osteosarcopenia,** which describes the decline of both muscle tissue (sarcopenia) and bone tissue (osteoporosis). Diagnoses and pharmaceuticals which deal with the central question of mobility will become ever more important, even more so as the burgeoning costs associated with caring for those with mobility issues becomes apparent.

The years between 30 and 60 can see the onset of **rheumatoid arthritis** (RA). This is the third most common form of arthritis

and its specific etiology is unknown at this time. RA occurs when antibodies attack normal synovial fluid in the joints mistaking them for an alien threat. **It affects women more than men by a factor of around 3 to 1**. Peak onset for women is reckoned to be sometime in the early 40s. This has led to the conclusion, albeit a preliminary one, that RA is caused by hormonal changes. Women who are pregnant, and have RA, often experience a temporary remission, again leading to the identification of hormonal changes in the body as the most likely culprit. Women also experience symptoms at an earlier age. This condition is often associated with people in their 60s, but only about a third first experience symptoms at this age, though they become more acute with the passage of time.

Human beings reach peak bone mass around 35-40. **Osteoporosis** is a "silent disease" which progresses until a fracture occurs. The sheer scale and cost of this illness is radically underestimated. It is often associated with women due to the fact that bone mass can deteriorate in women much more quickly in middle age due to menopause. After menopause women can lose 5-10% bone mass per year, rendering it advisable to monitor intakes of calcium and Vitamin D, and evaluate individual risk factors. Beginning in their 60s, though, men and women lose bone mass at roughly the same rate. The number of American men diagnosed with osteoporosis is currently around the 2 million mark, with a further 12 million reckoned to be at risk. The National Osteoporosis Foundation (NOF) estimates that 50% of women and 25% of men over the age of 50 will suffer a bone fracture due to osteoporosis. Attention at this stage of the life may bring pronounced health benefits now and later for both women and men. Fixing the damage takes a considerable amount of the Medicare budget.

The health benefits that walking and other physical activity have on the nervous system are becoming increasingly obvious to those who study aging. Adami et al (2018) found pronounced links between weight bearing exercise and neuron production. We tend to think of the brain as a central processing unit giving instructions to the body via the conduit of of the central nervous system, but contemporary

science is now coalescing around the idea that muscles and nerves also communicate with the brain—it is a two-way informational and sustaining process. Many studies suggest that voluntary physical activity (VPA) extends and improves quality of life. Such studies show that even moderate physical activity can bring large gains.

In addition, there is often an increase in **chronic inflammation** at this time of life with no discernible discrete cause (as opposed to acute inflammation associated with something like an infection). Inflammation is the body's natural way of responding to injury or harmful pathogens in the body. The function of inflammation is to eliminate the initial cause of injury and initiate tissue repair, but when this happens consistently and for longer periods of time, the body's stress response systems become overworked. This can have serious effects on health, such as fatigue, fever, chest or abdominal pain, rashes, or greater susceptibility to diseases such as cancer, rheumatoid arthritis, and heart disease. Untreated acute inflammation, autoimmune disorders, or long-term exposure to irritants are some contributing factors, as is social isolation (Nersessian et al, 2018).

Chronic inflammation has been implicated as part of the cause of the muscle loss that occurs with aging. Chronic inflammatory disorder is now implicated in a whole series of chronic diseases such as dementia, and the biomedical evidence for its centrality is now emerging in the medical research literature.

Because of the aging population, health issues associated with autoimmune disease, chronic inflammation, and bone mass density will become central concerns in health and social policy in the coming decades.

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Normal Physiological Changes in Middle Adulthood

There are a few primary biological physical changes in midlife. There are changes in vision, hearing, more joint pain, and weight gain (Lachman, 2004). Vision is affected by age. As we age, the lens of the eye gets larger but the eye loses some of the flexibility required to adjust to visual stimuli. This is known as **presbyopia**. Middle aged adults often have trouble seeing up close as a result. Night vision is also affected as the pupil loses some of its ability to open and close to accommodate drastic changes in light.

Presbycusis is the most common cause of hearing loss, afflicting one out of four persons between ages 65 and 74, and one out of two by age 75. This loss accumulates after years of being exposed to intense noise levels, and is generally due to the loss or damage

of nerve hair cells inside the cochlea. It is more common in men, but men are also more likely to work in noisy occupations, which may explain their nearly doubled rates of hearing loss levels. Hearing loss is also exacerbated by cigarette smoking, high blood pressure, and stroke. High frequency sounds are the first affected by such hearing loss. Hearing loss could be prevented by guarding against being exposed to extremely noisy environments.

There is new concern over hearing loss as early as childhood with the widespread use of headphones, as loud and/or prolonged listening can cause damage to the cilia, or the tiny sensory hairs, within the cochlea. Another cause of hearing loss in middle age is **otosclerosis**, a physiological condition affecting the middle ear and its bone structure. This occurs when one of the bones in the middle ear, the stapes, acquires a rigidity via abnormal bone growth which it should not have. Unable to vibrate, it induces hearing impairment. Otosclerosis is often described as a rare condition, but it afflicts a good number of Americans, with white women being more prone, though there has been some speculation that this was the origin of deafness in the composer Beethoven. Its cause is unknown, but chronic inflammation may be a risk factor. We tend to associate hearing loss with older adults, but peak onset is in the middle adulthood age bracket.

Weight gain, sometimes referred to as the middle-aged spread, or the accumulation of fat in the abdomen is one of the common complaints of midlife adults. Men tend to gain fat on their upper abdomen and back while women tend to gain more fat on their waist and upper arms. Many adults are surprised at this weight gain because their diets have not changed. However, the metabolism slows by about one-third during midlife (Berger, 2005). Consequently, midlife adults have to increase their level of exercise, eat less, and watch their nutrition to maintain their earlier physique.

Many of the changes that occur in midlife can be easily

compensated for (by buying glasses, exercising, and watching what one eats, for example.) Most midlife adults experience generally good health. However, the percentage of adults who have a disability increases through midlife; while 7 percent of people in their early 40s have a disability, the rate jumps to 30 percent by the early 60s. This increase is highest among those of lower socioeconomic status (Bumpass and Aquilino, 1995).

What can we conclude from this information? Again, lifestyle has a strong impact on the health status of midlife adults. Smoking tobacco, drinking alcohol, poor diet, stress, physical inactivity, and chronic disease such as diabetes or arthritis reduce overall health. It becomes important for midlife adults to take preventative measures to enhance physical well-being. Those midlife adults who have a strong sense of mastery and control over their lives, who engage in challenging physical and mental activity, who engage in weight bearing exercise, monitor their nutrition, and make use of social resources are most likely to enjoy a plateau of good health through these years. Not only that, but those who begin an exercise regimen in their 40s may enjoy comparable benefits to those who began in their 20s according to Saint-Maurice et al (2019), who also found that while it is never too late to begin, continuing to do as much as possible, is just as important.

The Climacteric

One biologically based change that occurs during midlife is the **climacteric**. During midlife, men may experience a reduction in their ability to reproduce. Women, however, lose their ability to reproduce once they reach menopause.

Menopause

Menopause refers to a period of transition in which a woman's ovaries stop releasing eggs and the level of estrogen and progesterone production decreases. After menopause, a woman's menstruation ceases (U. S. National Library of Medicine and National Institute of Health [NLM/NIH], 2007).

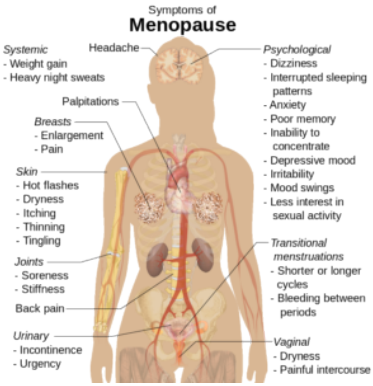

Figure 2. *Most women experience some of these common symptoms of menopause, but the severity and experience of these symptoms is also influenced by cultural expectations.*

Changes typically occur between the mid 40s and mid 50s. The median age range for a women to have her last menstrual period is 50-52, but ages vary. A woman may first begin to notice that her periods are more or less frequent than before. These changes in menstruation may last from 1 to 3 years. After a year without menstruation, a woman is considered menopausal and no longer capable of reproduction. (Keep in mind that some women, however, may experience another period even after going for a year without one.) The loss of estrogen also affects vaginal lubrication which diminishes and becomes more watery. The vaginal wall also becomes thinner, and less elastic.

Menopause is not seen as universally distressing (Lachman, 2004). Changes in hormone levels are associated with hot flashes and sweats in some women, but women vary in the extent to which these are experienced. Depression, irritability, and weight gain are not necessarily due to menopause (Avis, 1999; Rossi, 2004). Depression and mood swings are more common during menopause in women who have prior histories of these conditions rather than those who have not. The incidence of depression and mood swings

is not greater among menopausal women than non-menopausal women.

Cultural influences seem to also play a role in the way menopause is experienced. For example, once after listing the symptoms of menopause in a psychology course, a woman from Kenya responded, "We do not have this in my country or if we do, it is not a big deal," to which some U.S. students replied, "I want to go there!" Indeed, there are cultural variations in the experience of menopausal symptoms. Hot flashes are experienced by 75 percent of women in Western cultures, but by less than 20 percent of women in Japan (Obermeyer in Berk, 2007).

Women in the United States respond differently to menopause depending upon the expectations they have for themselves and their lives. White, career-oriented women, African-American, and Mexican-American women overall tend to think of menopause as a liberating experience. Nevertheless, there has been a popular tendency to erroneously attribute frustrations and irritations expressed by women of menopausal age to menopause and thereby not take her concerns seriously. Fortunately, many practitioners in the United States today are normalizing rather than pathologizing menopause.

Concerns about the effects of hormone replacement have changed the frequency with which estrogen replacement and hormone replacement therapies have been prescribed for menopausal women. Estrogen replacement therapy was once commonly used to treat menopausal symptoms. But more recently, hormone replacement therapy has been associated with breast cancer, stroke, and the development of blood clots (NLM/NIH, 2007). Most women do not have symptoms severe enough to warrant estrogen or hormone replacement therapy (HRT). Women who do require HRT can be treated with lower doses of estrogen and monitored with more frequent breast and pelvic exams. There are also some other ways to reduce symptoms. These include avoiding caffeine and alcohol, eating soy, remaining sexually active,

practicing relaxation techniques, and using water-based lubricants during intercourse.

Fifty million women in the USA aged 50-55 are post-menopausal. During and after menopause a majority of women will experience weight gain. Changes in estrogen levels lead to a redistribution of body fat from hips and back to stomachs. This is more dangerous to general health and wellbeing because abdominal fat is largely visceral, meaning it is contained within the abdominal cavity and may not look like typical weight gain. That is, it accumulates in the space between the liver, intestines and other vital organs. This is far more harmful to health than subcutaneous fat which is the kind of fat located under the skin. It is possible to be relatively thin and retain a high level of visceral fat, yet this type of fat is deemed especially harmful by medical research.

Andropause

Do males experience a climacteric? Yes. While they do not lose their ability to reproduce as they age, they do tend to produce lower levels of testosterone and fewer sperm. However, men are capable of reproduction throughout life after puberty. It is natural for sex drive to diminish slightly as men age, but a lack of sex drive may be a result of extremely low levels of testosterone. About 5 million men experience low levels of testosterone that results in symptoms such as a loss of interest in sex, loss of body hair, difficulty achieving or maintaining erection, loss of muscle mass, and breast enlargement. This decrease in libido and lower testosterone (androgen) levels is known as **andropause**, although this term is somewhat controversial as this experience is not clearly delineated, as menopause is for women. Low testosterone levels may be due to glandular disease such as testicular cancer. Testosterone levels can be tested and if they are low, men can be treated with testosterone replacement therapy. This can increase sex drive, muscle mass, and

beard growth. However, long term HRT for men can increase the risk of prostate cancer (The Patient Education Institute, 2005).

The debate around declining testosterone levels in men may hide a fundamental fact. The issue is not about individual males experiencing individual hormonal change at all. We have all seen the adverts on the media promoting substances to boost testosterone: "Is it low-T?" The answer is probably in the affirmative, if somewhat relative. That is, in all likelihood they will have lower testosterone levels than their fathers. However, it is equally likely that the issue does not lie solely in their individual physiological make up, but is rather a generational transformation (Travison et al, 2007). Why this has occurred in such a dramatic fashion is still unknown. There is evidence that low testosterone may have negative health effects on men. In addition, there are studies that show evidence of rapidly decreasing sperm count and grip strength. Exactly why these changes are happening is unknown and will likely involve more than one cause.

The Climacteric and Sexuality

Sexuality is an important part of people's lives at any age. Midlife adults tend to have sex lives that are very similar to that of younger adults. And many women feel freer and less inhibited sexually as they age. However, a woman may notice less vaginal lubrication during arousal and men may experience changes in their erections from time to time. This is particularly true for men after age 65. Men who experience consistent problems are likely to have other medical conditions (such as diabetes or heart disease) that impact sexual functioning (National Institute on Aging, 2005).

Couples continue to enjoy physical intimacy and may engage in more foreplay, oral sex, and other forms of sexual expression rather than focusing as much on sexual intercourse. Risk of pregnancy continues until a woman has been without menstruation for at least

12 months, however, and couples should continue to use contraception. People continue to be at risk of contracting sexually transmitted infections such as genital herpes, chlamydia, and genital warts. Seventeen percent of new cases of AIDS in the United States are in people 50 and older (https://www.cdc.gov/hiv/group/age/olderamericans/index.html). Of all people living with HIV, 47% are aged 50 or over (https://aidsinfo.nih.gov/understanding-hiv-aids/fact-sheets/25/80/hiv-and-older-adults). Practicing safe sex is important at any age- safe sex is not just about avoiding an unwanted pregnancy… it is about protecting yourself from STDs as well. Hopefully, when partners understand how aging affects sexual expression, they will be less likely to misinterpret these changes as a lack of sexual interest or displeasure in the partner and be more able to continue to have satisfying and safe sexual relationships.

Exercise, Nutrition, and Health

The impact of exercise

Figure 3. *Exercise has both physical and psychological benefits.*

Exercise is a powerful way to combat the changes we associate with aging. Exercise builds muscle, increases metabolism, helps control blood sugar, increases bone density, and relieves stress. Unfortunately, fewer than half of midlife adults exercise and only about 20 percent exercise frequently and strenuously enough to achieve health benefits. Many stop exercising soon after they begin an

exercise program-particularly those who are very overweight. The best exercise programs are those that are engaged in regularly—regardless of the activity, but a well-rounded program that is easy to follow includes walking and weight training. Having a safe, enjoyable place to walk can make a difference in whether or not someone walks regularly. Weight lifting and stretching exercises at home can also be part of an effective program. Exercise is particularly helpful in reducing stress in midlife. Walking, jogging, cycling, or swimming can release the tension caused by stressors, and learning relaxation techniques can have healthful benefits. Exercise can be thought of as preventative health care; promoting exercise for the 78 million "baby boomers" may be one of the best ways to reduce health care costs and improve quality of life (Shure & Cahan, 1998).

Nutrition

Aging brings about a reduction in the number of calories a person requires. Many Americans respond to weight gain by dieting. However, eating less does not necessarily mean eating right and people often suffer vitamin and mineral deficiencies as a result. Very often, physicians will recommend vitamin supplements to their middle-aged patients. As stated above, chronic inflammation is now identified as one of the so-called "pillars of aging". The link between diet and inflammation is yet unclear, but there is now some information available on the Diet Inflammation Index (Shivappa et, 2014), which in popular parlance, supports a diet rich in plant-based foods, healthy fats, nuts, fish in moderation, and sparing use of red meat— often referred to as "the Mediterranean Diet."

The ideal diet is one low in fat, low in sugar, high in fiber, low in sodium, and low in cholesterol. In 2005, the Food Pyramid, a set of nutritional guidelines established by the U. S. Government

was updated to accommodate new information on nutrition and to provide people with guidelines based on age, sex, and activity levels. The ideal diet is low in sodium (less than 2300 mg per day). Sodium causes fluid retention which may, in turn, exacerbate high blood pressure. The ideal diet is also low in cholesterol (less than 300 mg per day) and high in fiber. Fiber is thought to reduce the risk of certain cancers and heart disease. Finally, an ideal diet is low in sugar. Sugar is not only a problem for diabetics; it is also a problem for most people. Sugar satisfies the appetite but provides no protein, vitamins or minerals. It provides empty calories. High starch diets are also a problem because starch is converted to sugar in the body. A 1-2 ounce serving of red wine (or grape juice) may have beneficial effects on health, as red wine can increase "good cholesterol" or HDLs (high-density lipoproteins) in the blood and provide antioxidants important for combating aging. Try It

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Physical Development in Late Adulthood

In this section, you'll learn more about physical changes in late adulthood. While late adulthood is generally a time of physical decline, there are no set rules as to when and how it happens. We are continually learning more about how to promote greater health during the aging process.

Watch It

Watch this clip from Marco Pahor, a professor in the University of Florida department of aging and geriatric research, as he discusses his research about ways physical activity affects the mobility of older adults and how it may result in longer life, lower medical costs, and increased long-term independence.

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Defining Late Adulthood

Defining Late Adulthood: Age or Quality of Life?

***Figure 1**. 82-year old body builder Ernestine Shepard is quoted as saying, "You're not getting old; you're getting ready."*

We are considered in late adulthood from the time we reach our mid-sixties until death. Because we are living longer, late adulthood is getting longer. Whether we start counting at 65, as demographers may suggest, or later, there is a greater proportion of people alive in late adulthood than anytime in world history. A 10-year-old child today has a 50 percent chance of living to age 104. Some demographers have even speculated that the first person ever to live to be 150 is alive today.

About 15.2 percent of the U.S. population or 49.2 million Americans are 65 and older. This number is expected to grow to 98.2 million by the year 2060, at which time people in this age group will comprise nearly one in four U.S. residents. Of this number, 19.7 million will be age 85 or older. Developmental changes vary considerably among this population, so it is further divided into categories of 65 plus, 85 plus, and centenarians for comparison by the census.

Demographers use chronological age categories to classify individuals in late adulthood. Developmentalists, however, divide this population into categories based on physical and psychosocial well-being, in order to describe one's functional age. The "young-old" are healthy and active. The "old-old" experience some health problems and difficulty with daily living activities. The

"oldest old" are frail and often in need of care. A 98-year-old woman who still lives independently, has no major illnesses, and is able to take a daily walk would be considered as having a functional age of "young old". Therefore, *optimal aging* refers to those who enjoy better health and social well-being than average.

Normal aging refers to those who seem to have the same health and social concerns as most of those in the population. However, there is still much being done to understand exactly what *normal aging* means. *Impaired aging* refers to those who experience poor health and dependence to a greater extent than would be considered normal. Aging successfully involves making adjustments as needed in order to continue living as independently and actively as possible. This is referred to as selective optimization with compensation. **Selective Optimization With Compensation** is a strategy for improving health and well-being in older adults and a model for successful aging. It is recommended that seniors select and optimize their best abilities and most intact functions while compensating for declines and losses. This means, for example, that a person who can no longer drive, is able to find alternative transportation, or a person who is compensating for having less energy, learns how to reorganize the daily routine to avoid over-exertion. Perhaps nurses and other allied health professionals working with this population will begin to focus more on helping patients remain independent by optimizing their best functions and abilities rather than on simply treating illnesses. Promoting health and independence are essential for successful aging.

Watch It: Aging Successfully

Systematic examination of old age is a new field inspired by the unprecedented number of people living long enough

to become elderly. Developmental psychologists Paul and Margret Baltes have proposed a model of adaptive competence for the entire life span, but the emphasis here is on old age. Their model SOC (Selection, Optimization, and Compensation) is illustrated with engaging vignettes of people leading fulfilling lives, including writers Betty Friedan and Joan Erikson, and dancer Bud Mercer. Segments of the cognitive tests used by the Baltes in assessing the mental abilities of older people are shown. Although the video clip show below is old and dated, it remains an intellectually appealing video in which the Baltes discuss personality components that generally lead to positive aging experiences.

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Age Categories

Senescence, or **biological aging,** is the gradual deterioration of functional characteristics.

Figure 2*.The word senescence, can be traced back to Latin senex, meaning "old." Lots of other English words come from senex—senile, senior, senate, etc. The word senate to describe a legislative assembly dates back to ancient Rome, where the Senatus was originally a council of elders composed of the heads of patrician families. There's also the much rarer senectitude, which, like senescence, refers to the state of being old (specifically, to the final stage of the normal life span).*

The Young Old—65 to 74

These 18.3 million Americans tend to report greater health and social well-being than older adults. Having good or excellent health is reported by 41 percent of this age group (Center for Disease Control, 2004). Their lives are more similar to those of midlife adults than those who are 85 and older. This group is less likely to require long-term care, to be dependent or to be poor,

and more likely to be married, working for pleasure rather than income, and living independently. About 65 percent of men and 50 percent of women between the ages of 65-69 continue to work full-time (He et al., 2005).

Physical activity tends to decrease with age, despite the dramatic health benefits enjoyed by those who exercise. People with more education and income are more likely to continue being physically active. And males are more likely to engage in physical activity than are females. The majority of the young-old continue to live independently. Only about 3 percent of those 65-74 need help with daily living skills as compared with about 22.9 percent of people over 85. (Another way to consider think of this is that 97 percent of people between 65-74 and 77 percent of people over 85 do not require assistance!) This age group is less likely to experience heart disease, cancer, or stroke than the old, but nearly as likely to experience depression (U.S. Census, 2005).

The Old Old—75 to 84

This age group is more likely to experience limitations on physical activity due to chronic disease such as arthritis, heart conditions, hypertension (especially for women), and hearing or visual impairments. Rates of death due to heart disease, cancer, and cerebral vascular disease are double that experienced by people 65-74. Poverty rates are 3 percent higher (12 percent) than for those between 65 and 74. However, the majority of these 12.9 million Americans live independently or with relatives. Widowhood is more common in this group-especially among women.

The Oldest Old—85 plus

The number of people 85 and older is 34 times greater than in 1900

and now includes 5.7 million Americans. This group is more likely to require long-term care and to be in nursing homes. However, of the 38.9 million American over 65, only 1.6 million require nursing home care. Sixty-eight percent live with relatives and 27 percent live alone (He et al., 2005; U. S. Census Bureau, 2011).

The Centenarians

***Figure 3**. Kirk Douglas, actor and filmmaker, is a centenarian.*

Centenarians, or people aged 100 or older, are both rare and distinct from the rest of the older population. Although uncommon, the number of people living past age 100 is on the rise; between the year 2000 and 2014, then number of centarians increased by over 43.6%, from 50,281 in 2000 to 72,197 in 2014. In 2010, over half (62.5 percent) of the 53,364 centenarians were age 100 or 101.

This number is expected to increase to 601,000 by the year 2050 (U. S. Census Bureau, 2011). The majority is between ages 100 and 104 and eighty percent are women. Out of almost 7 billion people on the planet, about 25 are over 110. Most live in Japan, a few live the in United States and three live in France (National Institutes of Health, 2006). These "super-Centenarians" have led varied lives and probably do not give us any single answers about living longer. Jeanne Clement smoked until she was 117. She lived to be 122. She also ate a diet rich in olive oil and rode a bicycle until she was 100. Her family had a history of longevity. Pitskhelauri (in Berger, 2005) suggests that moderate diet, continued work and

activity, inclusion in family and community life, and exercise and relaxation are important ingredients for long life.

Blue Zones

Recent research on longevity reveals that people in some regions of the world live significantly longer than people elsewhere. Efforts to study the common factors between these areas and the people who live there is known as **blue zone research**. Blue zones are regions of the world where Dan Buettner claims people live much longer than average. The term first appeared in his November 2005 National Geographic magazine cover story, "The Secrets of a Long Life." Buettner identified five regions as "Blue Zones": Okinawa (Japan); Sardinia (Italy); Nicoya (Costa Rica); Icaria (Greece); and the Seventh-day Adventists in Loma Linda, California. He offers an explanation, based on data and first hand observations, for why these populations live healthier and longer lives than others.

The people inhabiting blue zones share common lifestyle characteristics that contribute to their longevity. The Venn diagram below highlights the following six shared characteristics among the people of Okinawa, Sardinia, and Loma Linda blue zones. Though not a lifestyle choice, they also live as isolated populations with a related gene pool.

- Family – put ahead of other concerns
- Less smoking
- Semi-vegetarianism – the majority of food consumed is derived from plants
- Constant moderate physical activity – an inseparable part of life
- Social engagement – people of all ages are socially active and integrated into their communities
- Legumes – commonly consumed

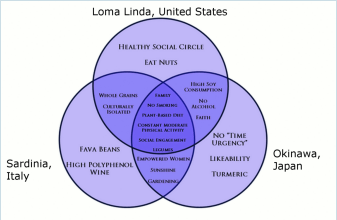

***Figure 4**. Blue zones share many common healthy habits contributing to longer lifespans.*

In his book, Buettner provides a list of nine lessons, covering the lifestyle of blue zones people:

- Moderate, regular physical activity.
- Life purpose.
- Stress reduction.
- Moderate caloric intake.
- Plant-based diet.
- Moderate alcohol intake, especially wine.
- Engagement in spirituality or religion.
- Engagement in family life.
- Engagement in social life.

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The "Graying" Population and Life Expectancy

The "Graying" of America

The term "graying of America" refers to the fact that the American population is steadily becoming more dominated by older people. In other words, the median age of Americans is going up.

According to the U.S. Census Bureau's 2017 National Population Projections, the year 2030 marks an important demographic turning point in U.S. history. By 2030, all baby boomers will be older than age 65. This will expand the size of the older population so that 1 in every 5 residents will be retirement age. And by 2035, it's projected

that there will be 76.7 million people under the age of 18 but 78 million people above the age of 65.

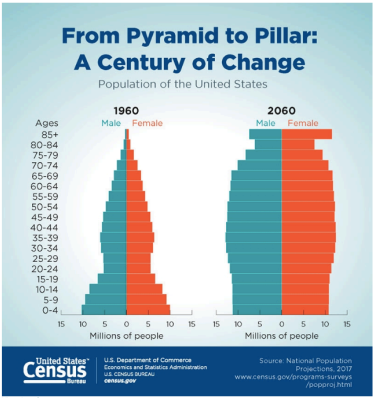

***Figure 5**. 2030 marks an important demographic change as international migration is expected to overtake natural increase in the United States.*

The 2030s are projected to be a transformative decade for the U.S. population. The population is expected to grow at a slower pace, age considerably and become more racially and ethnically diverse. Net international migration is projected to overtake natural increase in 2030 as the primary driver of population growth in the United States, another demographic first for the United States.

Although births are projected to be nearly four times larger than the level of net international migration in coming decades, a rising number of deaths will increasingly offset how much births are able to contribute to population growth. Between 2020 and 2050, the number of deaths is projected to rise substantially as the population ages and a significant share of the population, the baby boomers, age into older adulthood. As a result, the population will naturally grow very slowly, leaving net international migration to overtake natural increase as the leading cause of population growth, even as projected levels of migration remain relatively constant.

"Graying" Around the World

While the world's oldest countries are mostly in Europe today, some Asian and Latin American countries are quickly catching up. The percentage of the population aged 65 and over in 2015

ranged from a high of 26.6 percent for Japan to a low of around 1 percent for Qatar and United Arab Emirates. Of the world's 25 oldest countries, 22 are in Europe, with Germany and Italy leading the ranks of European countries for many years (He, Goodkind, and Kowal, 2015).

By 2050, Slovenia and Bulgaria are projected to be the oldest European countries. Japan, however, is currently the oldest nation in the world and is projected to retain this position through at least 2050. With the rapid aging taking place in Asia, the countries of South Korea, Hong Kong, and Taiwan are projected to join Japan at the top of the list of oldest countries and areas by 2050, when more than one-third of these Asian countries' total populations are projected to be aged 65 and over.

Life Expectancy

Life expectancy is a statistical measure of the average time an organism is expected to live, based on the year of birth, current age and other demographic factors including gender. The most commonly used measure of life expectancy is at birth (LEB). There are great variations in life expectancy in different parts of the world, mostly due to differences in public health, medical care, and diet, but also affected by education, economic circumstances, violence, mental health, and sex.

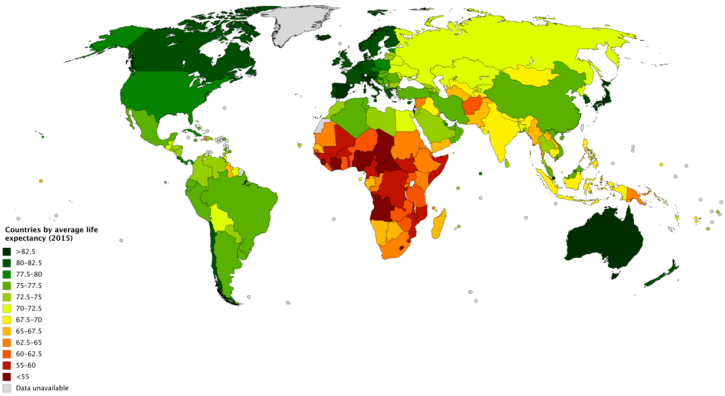

Figure 6. *Life expectancies around the world in 2015.*

Life Expectancy in the United States

According to the CDC (Centers for Disease Control and Prevention), life expectancy in the U.S. now stands at 78.7 years. Women continue to outlive men, with life expectancy being 76.3 years for males, and 81.1 years for females. Life expectancy varies according to race and ethnicity. It is highest for Hispanics, for both males and females, and lower for blacks than for whites or Hispanics.

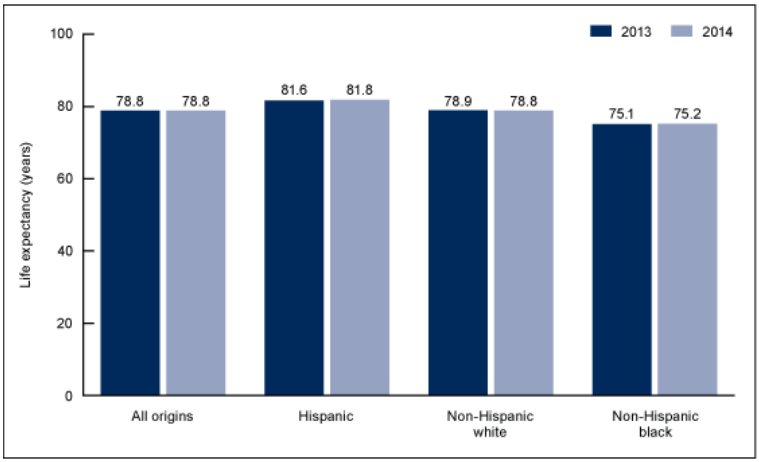

***Figure 7**. Life expectancy at birth, by race and Hispanic origin: United States, 2013 and 2014. From CDC/NCHS, National Vital Statistics System, Mortality.*

Statistics from the U.S. Census Bureau reveal that the 85-and over age group is the fastest-growing age group in America. According to the Census Bureau and AgingStats.gov, the over-65 population grew from 3 million in 1900 to 40 million in 2010, an increase of more than 1200%. But during this same time, the over-85 population grew from just over 100,000 in 1900 to 5.5 million in 2010–an increase of 5400%!

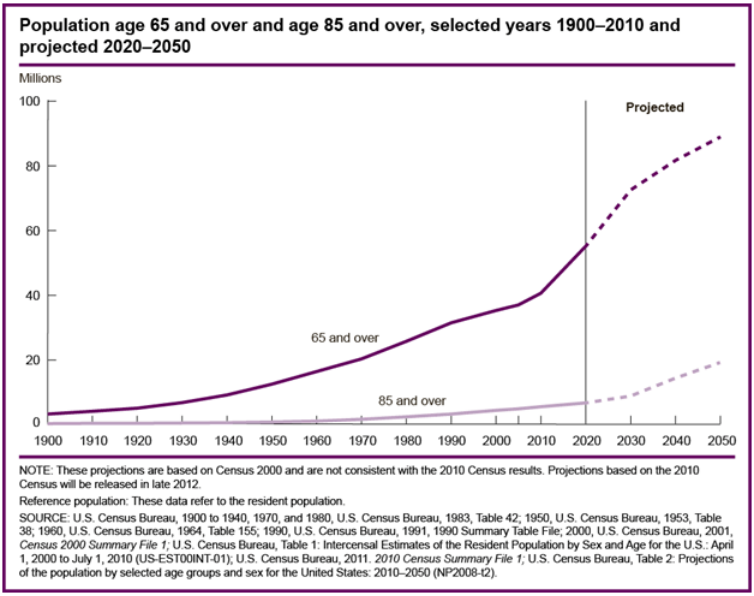

***Figure 8**. The elderly population is projected to grow significantly in the coming decades. Retrieved from https://partners4prosperity.com//wp-content/uploads/2014/09/aging-85-and-over.gif.*

When calculating life expectancy, we consider all of the elements of heredity, health history, current health habits, and current life experiences which contribute to a longer life or subtract from a person's life expectancy. Recent studies concluded that cutting calorie intake by 15 percent over two years can slow aging and protect against diseases such as cancer, diabetes, and Alzheimer's.

Some life factors are beyond a person's control, and some are controllable. The rising cost of health care is a source of financial vulnerability to older adults. Vaccines are especially important for older adults. As you get older you're more likely to get diseases like the flu, pneumonia, and shingles, and to have complications that can lead to long-term illness, hospitalization, and even death.

Things that contribute to longer life expectancies include eating

a healthy diet that is rich in plants and nuts. Staying physically active, not smoking, and consuming moderate amounts of alcohol, tea, or coffee are also reported to be beneficial to leading a long life. Other recommendations include being conscientious, prioritizing your happiness, avoiding stress and anxiety, and having a strong social support network. Establishing a consistent sleep schedule and maintaining between 7-8 hours of sleep per night is also beneficial.

A major reason a person will statistically live longer once they reach an older age is simply that they have made it this far without anything killing them. Also, there appears to be several factors which may explain changes in life expectancy in the United States and around the world—health conditions are better, many diseases have been eliminated or better controlled through medicine, working conditions are better and better lifestyles choices are being made. Such factors significantly contribute to longer life expectancies.

Life Expectancy Tables

Sometimes referred to mortality tables, death charts or actuarial life tables, these life expectancy tables are strictly statistical, and do not take into consideration any personal health information or lifestyle information. Take a look at life expectancy tables on the Life Expectancy Calculators website.

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Understanding Life Expectancy

Life expectancy is also used in describing the physical quality of life. **Quality of life** is the general well-being of individuals and societies, outlining negative and positive features of life. Quality of life considers life satisfaction, including everything from physical health, family, education, employment, wealth, safety, security, freedom, religious beliefs, and the environment.

Increased life expectancy brings concern over the health and independence of those living longer. Greater attention is now being given to the number of years a person can expect to live without disability, which is called **active life expectancy**. When this distinction is made, we see that although women live longer than men, they are more at risk of living with disability (Weitz, 2007).

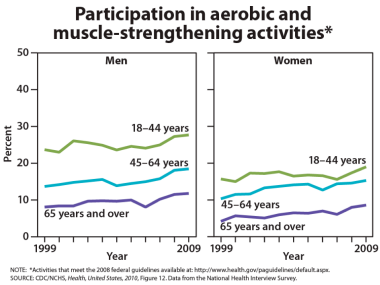

***Figure 9**. Physical activity remains low for those above age 65, although exercise can have tremendous health benefits and result in longer life expectancy.*

What factors contribute to poor health in women? Marriage has been linked to longevity, but spending years in a stressful marriage can increase the risk of illness. This negative effect is experienced more by women than men and seems to accumulate through the years. The impact of a stressful marriage on health may not occur until a woman reaches 70 or older (Umberson, Williams, et. al., 2006). Sexism can also create chronic stress. The stress experienced by women as they work outside the home as well as care for family members can also ultimately have a negative impact on health (He et als, 2005).

The shorter life expectancy for men in general, is attributed to greater stress, poorer attention to health, more involvement in dangerous occupations, and higher rates of death due to accidents, homicide, and suicide. Social support can increase longevity. For men, life expectancy and health seems to improve with marriage. Spouses are less likely to engage in risky health practices and wives are more likely to monitor their husband's diet and health regimes. But men who live in stressful marriages can also experience poorer health as a result.

Health and Sexuality

It has been suggested that an active sex life can increase longevity among the elderly. Dr. Maggie Syme found in her research on sexuality in old age that, "Having a sexual partnership, with frequent sexual expression, having a good quality sex life, and being interested in sex have been found to be positively associated with health among middle-aged and older adults." Positive sexual health in older age is gradually becoming more of a common topic and less taboo. Population percentage increase among older Americans has resulted in placing more attention on the needs of this age group, including their ideas on sexual health, desires, and attitudes. This shift in attitudes and behaviors, combined with medical advances to prolong a sexually active life, has changed the landscape of aging sexuality.

There are a number of associated health benefits with practicing positive sexual health. Positive sexual health often acts as a de-stressor promoting increased relaxation. Researchers also report health benefits such as decreased pain sensitivity, improved cardiovascular health, lower levels of depression, increased self-esteem, and better relationship satisfaction. This could also imply that there are negative consequences of poor sexual health or lack of sexual activity, including depression, low self-esteem, increased frustration, and loneliness.

Key players in improving the quality of life among older adults are the adults themselves. By exercising, reducing stress, not smoking, limiting use of alcohol, consuming more fruits and vegetables, and eating less meat and dairy, older adults can expect to live longer and more active lives (He et. als, 2005). Regular exercise is also associated with a lower risk of developing neurodegenerative disorders, especially Alzheimer's disease and Parkinson's disease. Stress reduction both in late adulthood and earlier in life is also crucial. The reduction of societal stressors can promote active life expectancy. In the last 40 years, smoking rates

have decreased, but obesity has increased, and physical activity has only modestly increased.

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Health in Late Adulthood: Primary Aging

Normal Aging

The Baltimore Longitudinal Study on Aging (BLSA, 2011) began in 1958 and has traced the aging process in 1,400 people from age 20 to 90. Researchers from the BLSA have found that the aging process varies significantly from individual to individual and from one organ system to another. Kidney function may deteriorate earlier in some individuals. Bone strength declines more rapidly in others. Much of

this is determined by genetics, lifestyle, and disease. However, some generalizations about the aging process have been found:

- Heart muscles thicken with age
- Arteries become less flexible
- Lung capacity diminishes
- Brain cells lose some functioning but new neurons can also be produced
- Kidneys become less efficient in removing waste from the blood
- The bladder loses its ability to store urine
- Body fat stabilizes and then declines
- Muscle mass is lost without exercise
- Bone mineral is lost. Weight bearing exercise slows this down.

Link to Learning

Watch this video clip from the National Institute of Health as it explains the research involved in the Baltimore Longitudinal Study on Aging. You'll see some of the tests done on individuals, including measurements on energy expenditure, strength, proprioception, and brain imaging and scans. Watch the The Baltimore Longitudinal Study of Aging (BLSA) here.

Primary and Secondary Aging

***Figure 10**. Primary aging includes inevitable changes such as skin that becomes more wrinkled and less elastic.*

Healthcare providers need to be aware of which aspects of aging are reversible and which ones are inevitable. By keeping this distinction in mind, caregivers may be more objective and accurate when diagnosing and treating older patients. And a positive attitude can go a long way toward motivating patients to stick with a health regime. Unfortunately, stereotypes can lead to misdiagnosis. For example, it is estimated that about 10 percent of older patients diagnosed with dementia are actually depressed or suffering from some other psychological illness (Berger, 2005). The failure to recognize and treat psychological problems in older patients may be one consequence of such stereotypes.

Primary Aging

Senescence is the biological aging is the gradual deterioration of functional characteristics. It is the process by which cells irreversibly stop dividing and enter a state of permanent growth arrest without undergoing cell death. This process is also referred to as **primary aging** and thus, refers to the inevitable changes associated with aging (Busse, 1969). These changes include changes in the skin and hair, height and weight, hearing loss, and eye disease. However, some of these changes can be reduced by limiting exposure to the sun, eating a nutritious diet, and exercising.

Skin and hair change with age. The skin becomes drier, thinner, and less elastic during the aging process. Scars and imperfections

become more noticeable as fewer cells grow underneath the surface of the skin. Exposure to the sun, or photoaging, accelerates these changes. Graying hair is inevitable, and hair loss all over the body becomes more prevalent.

Height and weight vary with age. Older people are more than an inch shorter than they were during early adulthood (Masoro in Berger, 2005). This is thought to be due to a settling of the vertebrae and a lack of muscle strength in the back. Older people weigh less than they did in mid-life. Bones lose density and can become brittle. This is especially prevalent in women. However, weight training can help increase bone density after just a few weeks of training.

Muscle loss occurs in late adulthood and is most noticeable in men as they lose muscle mass. Maintaining strong leg and heart muscles is important for independence. Weight-lifting, walking, swimming, or engaging in other cardiovascular and weight bearing exercises can help strengthen the muscles and prevent atrophy.

Vision

Some typical vision issues that arise along with aging include:

- Lens becomes less transparent and the pupils shrink.
- The optic nerve becomes less efficient.
- Distant objects become less acute.
- Loss of peripheral vision (the size of the visual field decreases by approximately one to three degrees per decade of life.)
- More light is needed to see and it takes longer to adjust to a change from light to darkness and vice versa.
- Driving at night becomes more challenging.
- Reading becomes more of a strain and eye strain occurs more easily.

The majority of people over 65 have some difficulty with vision, but most is easily corrected with prescriptive lenses. Three percent of those 65 to 74 and 8 percent of those 75 and older have hearing or vision limitations that hinder activity. The most common causes of vision loss or impairment are glaucoma, cataracts, age-related macular degeneration, and diabetic retinopathy (He et al., 2005).

- **Glaucoma** occurs when pressure in the fluid of the eye increases, either because the fluid cannot drain properly or because too much fluid is produced. Glaucoma can be corrected with drugs or surgery. It must be detected early enough.
- **Cataracts** are cloudy or opaque areas of the lens of the eye that interfere with passing light, frequently develop. Cataracts can be surgically removed or intraocular lens implants can replace old lenses.
- **Macular degeneration** is the most common cause of blindness in people over the age of 60. Age-related macular degeneration (AMD) affects the macula, a yellowish area of the eye located near the retina at which visual perception is most acute. A diet rich in antioxidant vitamins (C, E, and A) can reduce the risk of this disease.
- **Diabetic retinopathy**, also known as diabetic eye disease, is a medical condition in which damage occurs to the retina due to diabetes mellitus. It is a leading cause of blindness. There are three major treatments for diabetic retinopathy, which are very effective in reducing vision loss from this disease: laser photocoagulation, medications, surgery.

Hearing

Hearing Loss, is experienced by 25% of people between ages 65 and 74, then by 50% of people above age 75. Among those who are in nursing homes, rates are even higher. Older adults are more likely to seek help with vision impairment than with hearing loss, perhaps due to the stereotype that older people who have difficulty hearing are also less mentally alert.

Conductive hearing loss may occur because of age, genetic predisposition, or environmental effects, including persistent exposure to extreme noise over the course of our lifetime, certain illnesses, or damage due to toxins. Conductive hearing loss involves structural damage to the ear such as failure in the vibration of the eardrum and/or movement of the ossicles (the three bones in our middle ear). Given the mechanical nature by which the sound wave stimulus is transmitted from the eardrum through the ossicles to the oval window of the cochlea, some degree of hearing loss is inevitable. These problems are often dealt with through devices like hearing aids that amplify incoming sound waves to make vibration of the eardrum and movement of the ossicles more likely to occur.

When the hearing problem is associated with a failure to transmit neural signals from the cochlea to the brain, it is called **sensorineural hearing loss**. This type of loss accelerates with age and can be caused by prolonged exposure to loud noises, which causes damage to the hair cells within the cochlea. **Presbycusis** is age-related sensorineural hearing loss resulting from degeneration of the cochlea or associated structures of the inner ear or auditory nerves. The hearing loss is most marked at higher frequencies. Presbycusis is the second most common illness next to arthritis in aged people.

One disease that results in sensorineural hearing loss is **Ménière's disease**. Although not well understood, Ménière's disease results in a degeneration of inner ear structures that can lead to hearing loss, tinnitus (constant ringing or buzzing), **vertigo** (a sense of spinning), and an increase in pressure within the inner ear (Semaan &

Megerian, 2011). This kind of loss cannot be treated with hearing aids, but some individuals might be candidates for a cochlear implant as a treatment option. **Cochlear implants** are electronic devices consisting of a microphone, a speech processor, and an electrode array. The device receives incoming sound information and directly stimulates the auditory nerve to transmit information to the brain.

Being unable to hear causes people to withdraw from conversation and others to ignore them or shout. Unfortunately, shouting is usually high pitched and can be harder to hear than lower tones. The speaker may also begin to use a patronizing form of 'baby talk' known as **elderspeak** (See et al., 1999). This language reflects the stereotypes of older adults as being dependent, demented, and childlike. Hearing loss is more prevalent in men than women. And it is experienced by more white, non-Hispanics than by Black men and women. Smoking, middle ear infections, and exposure to loud noises increase hearing loss.

Nutrition and Aging Research

The Jean Mayer Human Nutrition Research Center on Aging (HNRCA), located in Boston, Massachusetts, is one of six human nutrition research centers in the United States supported by the United States Department of Agriculture and Agricultural Research Service. The goal of the HNRCA, which is managed by Tufts University, is to explore the relationship between nutrition, physical activity, and healthy and active aging.

The HNRCA has made significant contributions to U.S. and international nutritional and physical activity recommendations, public policy, and clinical

healthcare. These contributions include advancements in the knowledge of the role of dietary calcium and vitamin D in promoting nutrition and bone health, the role of nutrients in maintaining the optimal immune response, the prevention of infectious diseases, the role of diet in prevention of cancer, obesity research, modifications to the Food Guide Pyramid, contribution to USDA nutrient data bank, advancements in the study of sarcopenia, heart disease, vision, brain and cognitive function, front of packaging food labeling initiatives, and research of how genetic factors impact predisposition to weight gain and various health indicators. Research clusters within the HNRCA address four specific strategic areas: 1) cancer, 2) cardiovascular disease, 3) inflammation, immunity, and infectious disease and 4) obesity.

WAtch IT

Research done by T. Colin Campbell M.D., Michael Greger M.D., Neal Bernard M.D. and others have demonstrated the impact of diet upon longevity and quality of life. As discussed in the video below, consumption of less animal based protein has been linked with the slowing of degradation of function which was traditionally seen as part of the normal aging process.

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=119#oembed-6

Primary aging can be compensated for through exercise, corrective lenses, nutrition, and hearing aids. Just as important, by reducing stereotypes about aging, people of age can maintain self-respect, recognize their own strengths, and count on receiving the respect and social inclusion they deserve.

Try It

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https://topicaldevelopment.pressbooks.sunycreate.cloud/?p=119#oembed-7

Health in Late Adulthood: Secondary Aging

Secondary Aging

Secondary aging refers to changes that are caused by illness or disease. These illnesses reduce independence, impact quality of life, affect family members and other caregivers, and bring financial burden. The major difference between primary aging and secondary aging is that primary aging is irreversible and is due to genetic predisposition; secondary aging is potentially reversible and is a result of illness, health habits, and other individual differences.

Chronic Illnesses

Figure 11. *Secondary aging refers to the aspects of aging that are not universally shared by everyone, but are brought about by disease or chronic illness.*

In the United States, nearly one in two Americans (133 million) has at least one chronic medical condition, with most subjects (58%) between the ages of 18 and 64. The number is projected to increase by more than one percent per year by 2030, resulting in an estimated chronically ill population of 171 million. The most common chronic conditions are high blood pressure, arthritis, respiratory diseases like emphysema, and high cholesterol.

According to research by the Centers for Disease Control and Prevention, chronic disease is also especially a concern in the elderly population in America. Chronic diseases like stroke, heart disease, and cancer are among the leading causes of death among Americans aged 65 or older. While the majority of chronic conditions are found in individuals between the ages of 18 and 64, it is estimated that at least 80% of older Americans are currently living with some form of a chronic condition, with 50% of this population having two or more chronic conditions. The two most common chronic conditions in the elderly are high blood pressure and arthritis, with diabetes, coronary heart disease, and cancer also being reported at high rates among the elderly population. The presence of type 2 diabetes, high blood pressure, and obesity, is termed "metabolic syndrome" and impacts 50% of individuals over the age of 60.

Heart disease is the leading cause of death from chronic disease for adults older than 65, followed by cancer, stroke, diabetes, chronic lower respiratory diseases, influenza and pneumonia, and,

finally, Alzheimer's disease (which we'll examine further when we talk about cognitive decline). Though the rates of chronic disease differ by race for those living with chronic illness, the statistics for leading causes of death among elderly are nearly identical across racial/ethnic groups.

Heart Disease

As stated above, heart disease is the leading cause of death from chronic disease for adults older than 65. Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels. CVD includes coronary artery diseases (CAD) such as angina and myocardial infarction (commonly known as a heart attack). Other CVDs include stroke, heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease, valvular heart disease, carditis, aortic aneurysms, peripheral artery disease, thromboembolic disease, and venous thrombosis.

The underlying mechanisms vary depending on the disease. Coronary artery disease, stroke, and peripheral artery disease involve atherosclerosis. This may be caused by high blood pressure, smoking, diabetes mellitus, lack of exercise, obesity, high blood cholesterol, poor diet, and excessive alcohol consumption, among others. High blood pressure is estimated to account for approximately 13% of CVD deaths, while tobacco accounts for 9%, diabetes 6%, lack of exercise 6% and obesity 5%.

It is estimated that up to 90% of CVD may be preventable. Prevention of CVD involves improving risk factors through: healthy eating, exercise, avoidance of tobacco smoke and limiting alcohol intake. Treating risk factors, such as high blood pressure, blood lipids and diabetes is also beneficial. The use of aspirin in people, who are otherwise healthy, is of unclear benefit.

Cancer

Age in itself is one of the most important risk factors for developing cancer. Currently, 60% of newly diagnosed malignant tumors and 70% of cancer deaths occur in people aged 65 years or older. Many cancers are linked to aging; these include breast, colorectal, prostate, pancreatic, lung, bladder and stomach cancers. Men over 75 have the highest rates of cancer at 28 percent. Women 65 and older have rates of 17 percent. Rates for older non-Hispanic Whites are twice as high as for Hispanics and non-Hispanic Blacks. The most common types of cancer found in men are prostate and lung cancer. Breast and lung cancer are the most common forms in women.

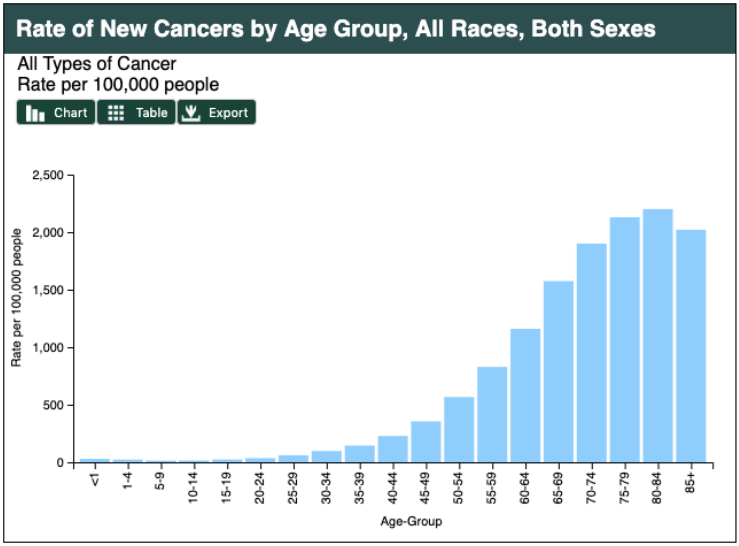
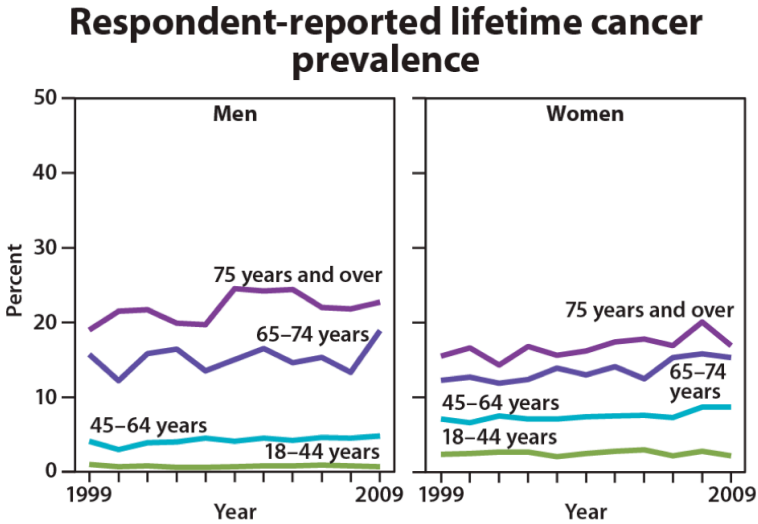


***Figure 12**. Age is a risk factor for cancer development. Source: https://gis.cdc.gov/Cancer/USCS/DataViz.html.*

For many reasons, older adults with cancer have different needs than younger adults with the disease. For example, older adults:

- May be less able to tolerate certain cancer treatments.
- Have a decreased reserve (the capacity to respond to disease and treatment).
- May have other medical problems in addition to cancer.
- May have functional problems, such as the ability to do basic activities (dressing, bathing, eating) or more advanced activities (such as using transportation, going shopping or handling finances), and have less available family support to assist them as they go through treatment.
- May not always have access to transportation, social support or financial resources.
- May have different views of quality versus quantity of life



SOURCE: CDC/NCHS, *Health, United States, 2010*, Figure 4. Data from the National Health Interview Survey.

Figure 13. *Cancer rates are significantly higher for those above age 65, and is more common in men than in women.*

Hypertension and Stroke

Hypertension or high blood pressure and associated heart disease and circulatory conditions increase with age. Stroke is a leading cause of death and severe, long-term disability. Most people who've had a first stroke also had high blood pressure (HBP or hypertension).High blood pressure damages arteries throughout the body, creating conditions where they can burst or clog more easily. Weakened arteries in the brain, resulting from high blood pressure, increase the risk for stroke—which is why managing high blood pressure is critical to reduce the chance of having a stroke. Hypertension disables 11.1 percent of 65 to 74 year olds and 17.1 percent of people over 75. Rates are higher among women and blacks. Rates are highest for women over 75. Coronary disease and stroke are higher among older men than women. The incidence of stroke is lower than that of coronary disease, but it is the No. 5 cause of death and a leading cause of disability in the United States.

Arthritis

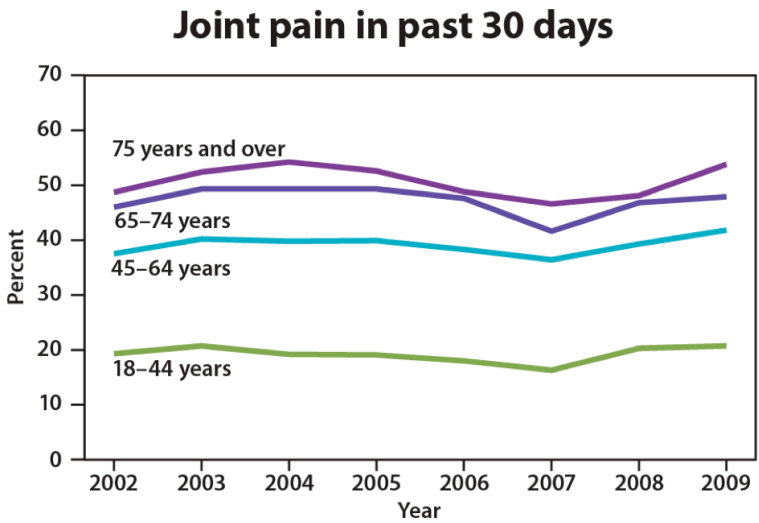
While **arthritis** can affect children, it is predominantly a disease of the elderly. Arthritis is more common in women than men at all ages and affects all races, ethnic groups and cultures. In the United States a CDC survey based on data from 2007–2009 showed 22.2% (49.9 million) of adults aged ≥18 years had self-reported doctor-diagnosed arthritis, and 9.4% (21.1 million or 42.4% of those with arthritis) had arthritis-attributable activity limitation (AAAL). With an aging population, this number is expected to increase.

Arthritis is a term often used to mean any disorder that affects joints. Symptoms generally include joint pain and stiffness. Other symptoms may include redness, warmth, swelling, and decreased range of motion of the affected joints. In some

types of arthritis, other organs are also affected. Onset can be gradual or sudden.

There are over 100 types of arthritis. The most common forms are osteoarthritis (degenerative joint disease) and rheumatoid arthritis. Osteoarthritis usually increases in frequency with age and affects the fingers, knees, and hips. Rheumatoid arthritis is an autoimmune disorder that often affects the hands and feet. Other types include gout, lupus, fibromyalgia, and septic arthritis. They are all types of rheumatic disease

Treatment may include resting the joint and alternating between applying ice and heat. Weight loss and exercise may also be useful. Pain medications such as ibuprofen and paracetamol (acetaminophen) may be used. In some a joint replacement may be useful.



SOURCE: CDC/NCHS, *Health, United States, 2010*, Figure 7. Data from the National Health Interview Survey.

Figure 14. *Joint pain increases with age.*

Older Americans & Cardiovascular Diseases

Visit this statistical fact sheet from the American Heart Association to learn more about some facts and figures related to heart disease.

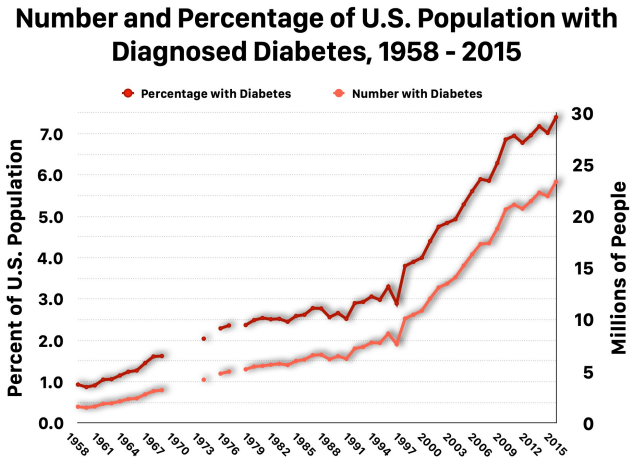
Diabetes

Type 2 diabetes (T2D), formerly known as adult-onset diabetes, is a form of diabetes characterized by high blood sugar, insulin resistance, and relative lack of insulin. Common symptoms include increased thirst, frequent urination, and unexplained weight loss. Symptoms may also include increased hunger, feeling tired, and sores that do not heal. Often symptoms come on slowly. Long-term complications from high blood sugar include heart disease, strokes, diabetic retinopathy which can result in blindness, kidney failure, and poor blood flow in the limbs which may lead to amputations.

Type 2 diabetes primarily occurs as a result of obesity and lack of exercise. Some people are more genetically at risk than others. Type 2 diabetes makes up about 90% of cases of diabetes, with the other 10% due primarily to type 1 diabetes and gestational diabetes. In type 1 diabetes there is a lower total level of insulin to control blood glucose, due to an autoimmune induced loss of insulin-producing beta cells in the pancreas. Diagnosis of diabetes is by blood tests such as fasting plasma glucose, oral glucose tolerance test, or glycated hemoglobin (A1C).

Type 2 diabetes is partly preventable by staying a normal weight, exercising regularly, and eating properly. Treatment involves exercise and dietary changes. If blood sugar levels are not adequately lowered, the medication metformin is typically recommended. Many people may eventually also require insulin injections. In those on insulin, routinely checking blood sugar levels is advised; however, this may not be needed in those taking pills. Bariatric surgery often improves diabetes in those who are obese.

Rates of type 2 diabetes have increased markedly since 1960 in parallel with obesity. As of 2015 there were approximately 392 million people diagnosed with the disease compared to around 30 million in 1985. Typically it begins in middle or older age, although rates of type 2 diabetes are increasing in young people. Type 2 diabetes is associated with a ten-year-shorter life expectancy.



Source: CDC's Division of Diabetes Translation. United States Diabetes Surveillance System available at http://www.cdc.gov/diabetes/data

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Ted Eytan, MD, MS, MPH @tedeytan revised 10.24.2018

***Figure 15**. In 1990, 2.52% of the total population had diabetes. It's now 9% of total, 12% of adults. It's estimated that 25% of adults will have diabetes in the US by 2030, 33% by 2050.*

Osteoporosis

Osteoporosis comes from the Greek word for "porous bones" and is a disease in which bone weakening increases the risk of a broken bone. It is defined as having a bone density of 2.5 standard deviations below that of a healthy young adult. Osteoporosis increases with age as bones become brittle and lose minerals. It is the most common reason for a broken bone among the elderly.

Osteoporosis becomes more common with age. About 15% of white people in their 50s and 70% of those over 80 are affected. It is four times more likely to affect women than men—in the developed world, depending on the method of diagnosis, 2% to 8% of males and 9% to 38% of females are affected. In the United States in 2010, about eight million women and one to two million men had osteoporosis. White and Asian people are at greater risk are more likely to have osteoporosis than non-Hispanic blacks.

Parkinson's Disease

Parkinson's disease (PD) is a long-term degenerative disorder of the central nervous system which mainly affects the motor system, although as the disease worsens, non-motor symptoms become increasingly common. Early in the disease, the most obvious symptoms are shaking, rigidity, slowness of movement, and difficulty with walking, but thinking and behavioral problems may also occur. Dementia becomes common in the advanced stages of the disease, and depression and anxiety also occur in more than a third of people with PD.

The cause of Parkinson's disease is generally unknown, but believed to involve both genetic and environmental factors. Those with a family member affected are more likely to get the disease themselves. There is also an increased risk in people exposed to certain pesticides and among those who have had prior head

injuries, while there is a reduced risk in tobacco smokers (though smokers are at a substantially greater risk of stroke) and those who drink coffee or tea. The motor symptoms of the disease result from the death of cells in the substantia nigra, a region of the midbrain, which results in not enough dopamine in these areas. The reason for this cell death is poorly understood, but involves the build-up of proteins into Lewy bodies in the neurons.

In 2015, PD affected 6.2 million people and resulted in about 117,400 deaths globally. Parkinson's disease typically occurs in people over the age of 60, of which about one percent are affected. Males are more often affected than females at a ratio of around 3:2. The average life expectancy following diagnosis is between 7 and 14 years. People with Parkinson's who have increased the public's awareness of the condition include actor Michael J. Fox, Olympic cyclist Davis Phinney, and professional boxer Muhammad Ali.

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Theories on Aging

Why do we age?

Figure 16. *There are several plausible theories as to why aging happens*

There are a number of attempts to explain why we age and many factors that contribute to aging. The **peripheral slowing hypothesis** suggests that overall processing speed declines in the peripheral nervous system, affecting the brain's ability to communicate with muscles and organs. Some of the peripheral nervous system (PNS) is under a person's voluntary control, such as the nerves carrying instructions from the brain to the limbs. As well as controlling muscles and joints, the PNS sends all the information from the senses back to the brain.

The **generalized slowing hypothesis** theory suggests that processing in all parts of the nervous system, including the brain, are less efficient with age. This may be why older people have more accidents. Genetics, diet, lifestyle, activity, and exposure to pollutants all play a role in the aging process.

Cell Life

Cells divide a limited number of times and then stop. This phenomenon, known as the **Hayflick limit**, is evidenced in cells studied in test tubes which divide about 50 times before becoming senescent. In 1961, Dr. Hayflick theorized that the human cell's ability to divide is limited to approximately 50-times, after which they simply stop dividing (the Hayflick limit theory of aging).

According to telomere theory, telomeres have experimentally been shown to shorten with each successive cell division.

Senescent cells do not die. They simply stop replicating. Senescent cells can help limit the growth of other cells which may reduce risk of developing tumors when younger, but can alter genes later in life and result in promoting the growth of tumors as we age (Dollemore, 2006). Limited cell growth is attributed to telomeres which are the tips of the protective coating around chromosomes. Each time cells replicate, the telomere is shortened. Eventually, loss of telomere length is thought to create damage to chromosomes and produce cell senescence.

Link to Learning

Watch this Ted talk by molecular biologist Elizabeth Blackburn on "The Science of Cells That Never Get Old." Blackburn won a Nobel Prize for her pioneering work on telomeres and telomerase, which may play central roles in how we age.

Biochemistry and Aging

Free Radical Theory of Aging

The **free radical theory of aging** (**FRTA**) states that organisms age because cells accumulate free radical damage over time. A free radical is any atom or moleculewhich has a single unpaired electron in an outer shell. This means that as oxygen is metabolized, mitochondria in the cells convert the oxygen to

adenosine triphosphate (ATP) which provides energy to the cell. Unpaired electrons are a byproduct of this process and these unstable electrons cause cellular damage as they find other electrons with which to bond. These free radicals have some benefits and are used by the immune system to destroy bacteria. However, cellular damage accumulates and eventually reduces functioning of organs and systems. Many food products and vitamin supplements are promoted as age-reducing. Antioxidant drugs have been shown to increase the longevity in nematodes (small worms), but the ability to slow the aging process by introducing antioxidants in the diet is still controversial.

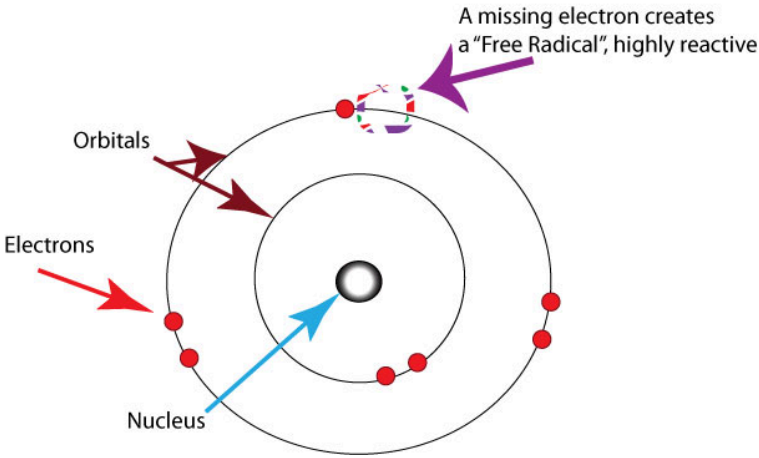

Figure 17*. In chemistry, a free radical is any atom, molecule, or ion with an unpaired valence electron*

Protein Crosslinking

This theory focuses on the role blood sugar, or glucose, plays in the aging of cells. Glucose molecules attach themselves to proteins and form chains or crosslinks. These crosslinks reduce the flexibility of tissue and thus it becomes stiff and loses functioning. The circulatory system becomes less efficient as the tissue of the heart, arteries and lungs lose flexibility. Joints grow stiff as glucose combines with collegen.

DNA Damage

Through the normal growth and aging process, DNA is damaged by environmental factors such as toxic agents, pollutants, and sun exposure (Dollemore, 2006). This results in deletions of genetic material, and mutations in the DNA duplicated in new cells. The accumulation of these errors results in reduced functioning in cells and tissues. Theories that suggest that the body's DNA genetic code contains a built-in time limit for the reproduction of human cells are called the genetic programming theories of aging. These theories promote the view that the cells of the body can only duplicate a certain number of times and that the genetic instructions for running the body can be read only a certain number of times before they become illegible. Such theories also promote the existence of a "death gene" which is programmed to direct the body to deteriorate and die, and the idea that a long life after the reproductive years is unnecessary for the survival of the species.

As we age, B-lymphocytes and T-lymphocytes become less active. These cells are crucial to the immune system as they secrete antibodies and directly attack infected cells. The thymus, where T-cells are manufactured, shrinks as aging progresses. This reduces our body's ability to fight infection (Berger, 2005).

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Glossary

active life expectancy: the number of years a person can expect to live without disability

alarm reaction: first stage of the general adaptation syndrome; characterized as the body's immediate physiological reaction to a threatening situation or some other emergency; analogous to the fight-or-flight response

andropause: age-related hormone changes in men due to lower testosterone levels

arthritis: arthritis is inflammation of one or more of the joints, characterized by joint pain and stiffness, which typically worsen with age

artificial insemination: the deliberate introduction of sperm into a female's cervix in order to become pregnant by means other than sexual intercourse

biofeedback: stress-reduction technique using electronic equipment to measure a person's involuntary (neuromuscular and autonomic) activity and provide feedback to help the person gain a level of voluntary control over these processes

blue zones: regions of the world where Dan Buettner claims people live much longer than average

cardiovascular disorders: disorders that involve the heart and blood circulation systemstage of exhaustion: third stage of the general adaptation syndrome; the body's ability to resist stress becomes depleted; illness, disease, and even death may occur

centenarians: people aged 100 or older

chlamydia: a sexually transmitted infection caused by the bacterium chlamydia trachomatis

chronic inflammation: when the body's immune system is working

to fight off infections and toxins for prolonged periods of time, having a negative impact on tissues and organs

climacteric: term used to describe the menopausal period and hormonal changes associated with the gradual change in ovarian production

cochlear implant: electronic device that consists of a microphone, a speech processor, and an electrode array to directly stimulate the auditory nerve to transmit information to the brain

conductive hearing loss: failure in the vibration of the eardrum and/or movement of the ossicles

coping: mental or behavioral efforts used to manage problems relating to stress, including its cause and the unpleasant feelings and emotions it produces

cortisol: stress hormone released by the adrenal glands when encountering a stressor; helps to provide a boost of energy, thereby preparing the individual to take action

daily hassles: minor irritations and annoyances that are part of our everyday lives and are capable of producing stress

distress: bad form of stress; usually high in intensity; often leads to exhaustion, fatigue, feeling burned out; associated with erosions in performance and health

endometriosis: a condition in which the layer of tissue that normally covers the inside of the uterus, grows outside of it

eustress: good form of stress; low to moderate in intensity; associated with positive feelings, as well as optimal health and performance

fight-or-flight response: set of physiological reactions (increases in blood pressure, heart rate, respiration rate, and sweat) that occur when an individual encounters a perceived threat; these reactions are produced by activation of the sympathetic nervous system and the endocrine system

free radical theory of aging (FRTA): theory that organisms age because cells accumulate free radical damage over time

gamete intrafallopian tube transfer: involves implanting both sperm and ova into the fallopian tube which allows fertilization to occur naturally

general adaptation syndrome: Hans Selye's three-stage model of the body's physiological reactions to stress and the process of stress adaptation: alarm reaction, stage of resistance, and stage of exhaustion

generalized slowing hypothesis: the theory that processing in all parts of the nervous system, including the brain, is less efficient

gonorrhea: a sexually transmitted infection (STI) caused by the bacterium neisseria gonorrhoeae

Hayflick limit: the number of times a normal human cell population will divide before cell division stops

health psychology: subfield of psychology devoted to studying psychological influences on health, illness, and how people respond when they become ill

heart disease: several types of adverse heart conditions, including those that involve the heart's arteries or valves or those involving the inability of the heart to pump enough blood to meet the body's needs; can include heart attack and stroke

hypertension: high blood pressure that can lead to severe complications and increases the risk of heart disease, stroke, and death

hypothalamic-pituitary-adrenal (HPA) axis: set of structures found in both the limbic system (hypothalamus) and the endocrine system (pituitary gland and adrenal glands) that regulate many of the body's physiological reactions to stress through the release of hormones

immune system: various structures, cells, and mechanisms that protect the body from foreign substances that can damage the body's tissues and organs

immunosuppression: decreased effectiveness of the immune system

in vitro fertilization: this procedure involves removing eggs from

the female, fertilizing the eggs outside the woman's body, and then reinserting into the woman's uterus

life expectancy: a statistical measure of the average time an organism is expected to live, based on the year of its birth, its current age and other demographic factors including gender

job burnout: general sense of emotional exhaustion and cynicism in relation to one's job; consists of three dimensions: exhaustion, depersonalization, and sense of diminished personal accomplishment

job strain: work situation involving the combination of excessive job demands and workload with little decision making latitude or job control

lymphocytes: white blood cells that circulate in the body's fluids and are especially important in the body's immune response

Ménière's disease: results in a degeneration of inner ear structures that can lead to hearing loss, tinnitus, vertigo, and an increase in pressure within the inner ear

menopause: period of transition in which a woman's ovaries stop releasing eggs and the level of estrogen and progesterone production decreases

osteoporosis: a condition in which the bones become brittle, fragile, and thin, often brought about by a lack of calcium in the diet

primary aging: aging that is irreversible and is due to genetic predisposition

primary appraisal: judgment about the degree of potential harm or threat to well-being that a stressor might entail

psychoneuroimmunology: field that studies how psychophysiological disorders: physical disorders or diseases in which symptoms are brought about or worsened by stress and emotional factorspsychological factors (such as stress) influence the immune system and immune functioning

osteosarcopenia: when someone has both sarcopenia and osteoporosis, or both muscle and bone tissue loss

Parkinson's disease: long-term degenerative disorder of the central nervous system which mainly affects the motor system,

first characterized by shaking, rigidity, slowness of movement, and difficulty with walking, but thinking and behavioral problems may also occur

perceived control: peoples' beliefs concerning their capacity to influence and shape outcomes in their lives

pelvic inflammatory disease: an infection of the upper part of the female reproductive system, namely the uterus, fallopian tubes, and ovaries, and inside of the pelvis

peripheral slowing hypothesis: the theory that overall processing speed declines with age in the peripheral nervous system

presbycusis: age-related sensorineural hearing loss resulting from degeneration of the cochlea or associated structures of the inner ear or auditory nerves

presbyopia: farsightedness caused by loss of flexibility of the lens of the eye as a result of aging

quality of life: the general well-being of individuals and societies, including life satisfaction, physical health, family, education, employment, wealth, safety, security, freedom, religious beliefs, and the environment

relaxation response technique: stress reduction technique combining elements of relaxation and meditation

sarcopenia: the technical term for the loss of muscle tissue and function as we age

secondary aging: refers to changes that are caused by illness or disease

secondary appraisal: judgment of options available to cope with a stressor and their potential effectiveness

Selective Optimization with Compensation (SOC): a strategy for improving health and well being in older adults and a model for successful aging

senescence: biological aging and the gradual deterioration of functional abilities

sensorineural hearing loss: failure to transmit neural signals from the cochlea to the brain

Social Readjustment Rating Scale (SRRS): popular scale designed

to measure stress; consists of 43 potentially stressful events, each of which has a numerical value quantifying how much readjustment is associated with the event

social support: soothing and often beneficial support of others; can take different forms, such as advice, guidance, encouragement, acceptance, emotional comfort, and tangible assistance

stage of resistance: second stage of the general adaptation syndrome; the body adapts to a stressor for a period of time

stress: process whereby an individual perceives and responds to events that one appraises as overwhelming or threatening to one's well-being

stressors: environmental events that may be judged as threatening or demanding; stimuli that initiate the stress process

temporal theory of pitch perception: sound's frequency is coded by the activity level of a sensory neuron

Type A: psychological and behavior pattern exhibited by individuals who tend to be extremely competitive, impatient, rushed, and hostile toward others

Type B: psychological and behavior pattern exhibited by a person who is relaxed and laid back

type 2 diabetes (T2D): diabetes characterized by high blood sugar, insulin resistance, and relative lack of insulin primarily from obesity or lack of exercise

vertigo: spinning sensation

zygote intrafallopian tube transfer: sperm and ova are fertilized outside of the woman's body and the zygote is then implanted in the fallopian tube to allow the zygote to travel and embed in the lining of the uterus naturally

COGNITIVE DEVELOPMENT IN ADULTHOOD

Learning outcomes

- Distinguish between formal and postformal thought
- Describe cognitive development and dialectical thought during early adulthood
- Describe educational trends in early adulthood
- Explain the relationship between education and work in early adulthood
- Outline cognitive gains/deficits typically associated with middle adulthood
- Explain changes in fluid and crystallized intelligence during adulthood
- Discuss the impact of aging on memory
- Explain how age impacts cognitive functioning
- Describe abnormal memory loss due to Alzheimer's disease, delirium, and dementia

Cognitive Development in Early Adulthood

We have learned about cognitive development from infancy through adolescence, ending with Piaget's stage of formal operations. Does that mean that cognitive development stops with adolescence? Couldn't there be different ways of thinking in adulthood that come after (or "post") formal operations?

In this section, we will learn about these types of postformal operational thought and consider research done by William Perry related to types of thought and advanced thinking. We will also look at education in early adulthood, the relationship between education and work, and some tools used by young adults to choose their careers.

Cognitive Development in Early Adulthood

Beyond Formal Operational Thought: Postformal Thought

***Figure 1**. As young adults gain more experience, they think increasingly more in the abstract and are able to understand different perspectives and complexities.*

In the adolescence module, we discussed Piaget's formal operational thought. The hallmark of this type of thinking is the ability to think abstractly or to consider possibilities and ideas about circumstances never directly experienced. Thinking abstractly is only one characteristic of adult thought, however. If you compare a 14-year-old with someone in their late 30s, you would probably find that the later considers not only what is possible, but also what is likely. Why the change? The young adult has gained experience and understands why possibilities do not always become realities. This difference in adult and adolescent thought can spark arguments between the generations.

Here is an example. A student in her late 30s relayed such an argument she was having with her 14-year-old son. The son had saved a considerable amount of money and wanted to buy an old car and store it in the garage until he was old enough to drive. He could sit in it, pretend he was driving, clean it up, and show it to his friends. It sounded like a perfect opportunity. The mother, however, had practical objections. The car would just sit for several years while deteriorating. The son would probably change his mind about the type of car he wanted by the time he was old enough to drive and they would be stuck with a car that would not run. She was also

concerned that having a car nearby would be too much temptation and the son might decide to sneak it out for a quick ride before he had a permit or license.

Piaget's theory of cognitive development ended with formal operations, but it is possible that other ways of thinking may develop after (or "post") formal operations in adulthood (even if this thinking does not constitute a separate "stage" of development). **Postformal thought** is practical, realistic and more individualistic, but also characterized by understanding the complexities of various perspectives. As a person approaches the late 30s, chances are they make decisions out of necessity or because of prior experience and are less influenced by what others think. Of course, this is particularly true in individualistic cultures such as the United States. Postformal thought is often described as more flexible, logical, willing to accept moral and intellectual complexities, and dialectical than previous stages in development.

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Perry's Scheme

One of the first theories of cognitive development in early adulthood originated with William Perry (1970), who studied undergraduate students at Harvard University. Perry noted that over the course of students' college years, cognition tended to shift from **dualism** (absolute, black and white, right and wrong type of thinking) to **multiplicity** (recognizing that some problems are solvable and some answers are not yet known) to **relativism** (understanding the importance of the specific context of knowledge—it's all relative to other factors). Similar to Piaget's formal operational thinking in adolescence, this change in thinking in early adulthood is affected by educational experiences.

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Video 1. *Perry's Scheme of Intellectual Development.*

Table 1. Stages of Perry's Scheme

	Summary of Position in Perry's Scheme	Basic Example
Dualism	The authorities know	*"the tutor knows what is*
	The true authorities are right, the others are frauds	*"my tutor doesn't know w*
Multiplicity	There are some uncertainties and the authorities are working on them to find the truth	*"my tutors don't know, bu*
	(a) Everyone has the right to their own opinion (b) The authorities don't want the right answers. They want us to think in a certain way	*"different tutors think diff* *"there is an answer that t*
Relativism	Everything is relative but not equally valid	*"there are no right and wr* *might be better than other*
	You have to make your own decisions	*"what is important is not*
	First commitment	*"for this particular topic I*
	Several Commitments	*"for these topics I think th*
	Believe own values, respect others, be ready to learn	*"I know what I believe in* *prepared to reconsider my*

Dialectical Thought

In addition to moving toward more practical considerations, thinking in early adulthood may also become more flexible and balanced. Abstract ideas that the adolescent believes in firmly may become standards by which the individual evaluates reality. As Perry's research pointed out, adolescents tend to think in dichotomies or absolute terms; ideas are true or false; good or bad; right or wrong and there is no middle ground. However, with education and experience, the young adult comes to recognize that there is some right and some wrong in each position. Such thinking is more realistic because very few positions, ideas, situations, or people are completely right or wrong.

Some adults may move even beyond the relativistic or contextual thinking described by Perry; they may be able to bring together

important aspects of two opposing viewpoints or positions, synthesize them, and come up with new ideas. This is referred to as **dialectical thought** and is considered one of the most advanced aspects of postformal thinking (Basseches, 1984). There isn't just one theory of postformal thought; there are variations, with emphasis on adults' ability to tolerate ambiguity or to accept contradictions or find new problems, rather than solve problems, etc. (as well as relativism and dialecticism that we just learned about). What they all have in common is the proposition that the way we think may change during adulthood with education and experience.

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Schaie and Willis' Stage Theory of Cognition

Another perspective on post-formal cognitive development focuses less on the development of cognitive skills and instead discerns the

changes in the use of intellect. Shaie and Willis' stage theory of cognition proposed several stages of adult cognitive development.

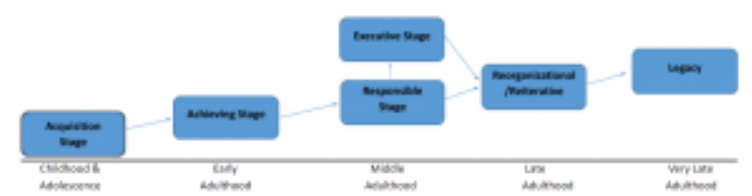

Figure 2. Shaie & Willis' Stage Theory of Cognition.

During childhood and adolescence, cognition is about the *acquisition* of new knowledge and skills. These young people may not yet know how they will use these acquired skills. In early adulthood, people switch their focus from the acquisition to the application of knowledge, as they use what they know to pursue careers and develop their families. This is called the *achieving stage.* It represents most prominently the application of intelligence in situations that have profound consequences for achieving long-term goals. The kind of intelligence exhibited in such situations is similar to that employed in educational tasks, but it requires careful attention to the possible consequences of the problem-solving process.

Adults who have mastered the cognitive skills required for monitoring their own behavior and, as a consequence, have attained a certain degree of personal independence will next move into a stage that requires the application of cognitive skills in situations involving social responsibility. Typically, the *responsible stage* occurs when a family is established and the needs of a spouse and offspring must be met. Similar extensions of adult cognitive skills are required as responsibilities for others are acquired on the job and in the community.

Some individuals' responsibilities become exceedingly complex. Such individuals◇presidents of business firms, deans of academic institutions, officials of churches, and a number of other positions◇need to understand the structure and the dynamic forces of organizations. They must monitor organizational activities not only on a temporal dimension (past, present, and future), but also up and down the hierarchy that defines the organization. They need to know not only the future plans of the organization but also whether policy decisions are being adequately translated into action at lower levels of responsibility. Attainment of the *executive stage*, as a variation on the responsibility stage, depends on exposure to opportunities that allow the development and practice of the relevant skills (Avolio, 1991; Smith, Staudinger, & Baltes, 1994).

In the later years of life, beyond the age of 60 or 65, the need to acquire knowledge declines even more, and executive monitoring is less important because frequently the individual has retired from the position that required such an application of intelligence. This stage, *reintegration*, corresponds in its position in the life course to Erikson's stage of ego integrity. The information that elderly people acquire and the knowledge they apply becomes a function of their interests, attitudes, and values. It requires, in fact, the reintegration of all of these. The elderly are less likely to "waste time" on tasks that are meaningless to them. They are unlikely to expend much effort to solve a problem unless that problem is one that they face frequently in their lives. This stage frequently includes a selective reduction of interpersonal networks in the interest of reintegrating one's concern in a more self-directed and supportive manner (cf. Carstensen, 1993; Carstensen, Gross, & Fung, 1997). In addition, efforts must be directed towards planning how one's resources will last for the remaining 15 to 30 years of post-retirement life that are

now characteristic for most individuals in industrialized societies. These efforts include active planning for that time when dependence upon others may be required to maintain a high quality of life in the face of increasing frailty. Such efforts may involve changes in one's housing arrangements, or even one's place of residence, as well as making certain of the eventual availability of both familial and extra-familial support systems. The activities involved in this context include making or changing one's will, drawing up advanced medical directives and durable powers of attorney, as well as creating trusts or other financial arrangements that will protect resources for use during the final years of life or for the needs of other family members.

Although some of these activities involve the same cognitive characteristics of the responsible stage, these objectives involved are far more centered upon current and future needs of the individual rather than the needs of their family or of an organizational entity. Efforts must now be initiated to *reorganize* one's time and resources to substitute a meaningful environment, often found in leisure activities, volunteerism, and involvement with a larger kinship network. Eventually, however, activities are also engaged in maximizing the quality of life during the final years, often with the additional objective of not becoming a burden for the next generation. The unique objective of these demands upon the individual represent an almost universal process occurring at least in the industrialized societies, and designation of a separate reorganizational stage is therefore warranted. The skills required for the reorganizational stage require the maintenance of reasonably high levels of cognitive competence. In addition, maintenance of flexible cognitive styles are needed to be able to restructure the context and content of life after retirement, to relinquish control of resources to others and to accept the partial surrender of one's independence (Schaie, 1984; 2005).

Many older persons reach advanced old age in relative comfort and often with a clear mind albeit a frail body. Once the

reintegrative efforts described above
have been successfully completed, yet one other stage is frequently observed. This last stage is concerned with cognitive activities by many of the very old that occur in anticipation of the end of their life. This is a *legacy stage that* is part of the cognitive development of many, if not all, older persons. This stage often begins
by the effort to conduct a life review (Butler, Lewis, & Sunderland, 1998). For the highly literate and those successful in public or professional life this will often include writing or revising an autobiography (Birren, Kenyon, Ruth, Schroots, & Swensson, 1995; Birren & Schroots, 2006). There are also many other more mundane legacies to be left. Women, in particular, often wish to put their remaining effects in order and often distribute many of their prized possessions to friends and relatives, or create elaborate instructions for distributing them. It is not uncommon for many very old people to make a renewed effort at providing an oral history or to explain family pictures and heirloom to the next generation. Last, but not least, directions may be given for funeral arrangements, occasionally including the donation of one's body for scientific research, and there may be a final revision of one's will.

Education and Work

Education in Early Adulthood

According to the U.S. Census Bureau (2017), 90 percent of the American population 25 and older have completed high school or higher level of education—compare this to just 24 percent in 1940! Each generation tends to earn (and perhaps need) increased levels of formal education. As we can see in the graph, approximately one-third of the American adult population has a bachelor's degree or

higher, as compared with less than 5 percent in 1940. Educational attainment rates vary by gender and race. All races combined, women are slightly more likely to have graduated from college than men; that gap widens with graduate and professional degrees. However, wide racial disparities still exist. For example, 23 percent of African-Americans have a college degree and only 16.4 percent of Hispanic Americans have a college degree, compared to 37 percent of non-Hispanic white Americans. The college graduation rates of African-Americans and Hispanic Americans have been growing in recent years, however (the rate has doubled since 1991 for African-Americans and it has increased 60 percent in the last two decades for Hispanic-Americans).

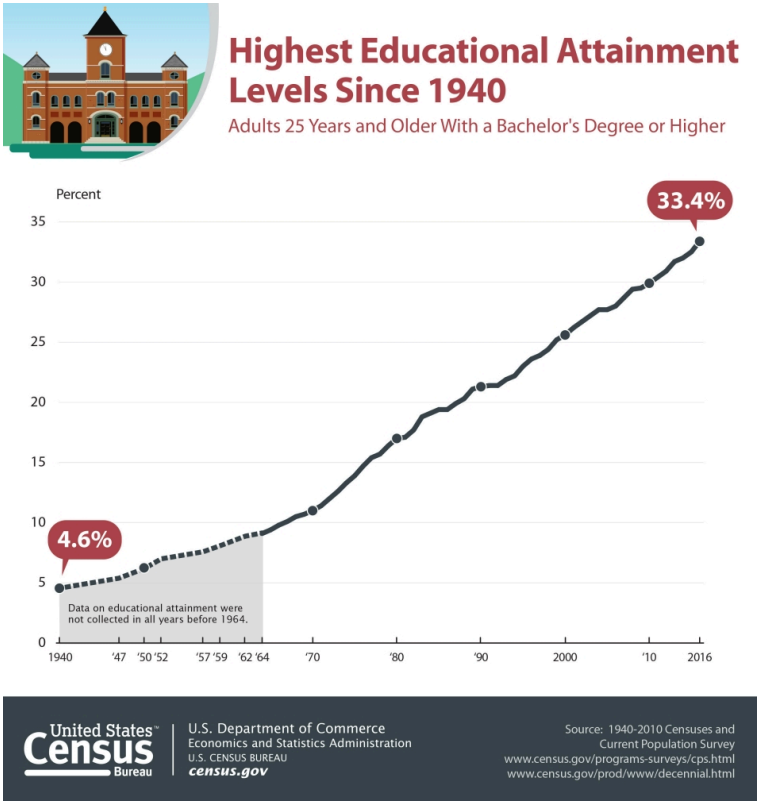

Figure 2. *Since 1940, there has been a significant rise in educational attainment for adults over age 25.*

What about those young or emerging adults graduating high school today—is the majority of that group going to college? According to the U.S. Bureau of Labor Statistics (2017), 66.7 percent of youth ages 16-24 who graduated high school between January and October 2017 were enrolled in colleges or universities in October 2017. There were gender differences (71.7 percent of females vs. 61.1 percent of males) and racial differences (83 percent of Asians, 67.1 percent of non-Hispanic whites, 61 percent Hispanics, and 59.4 percent Blacks). Not all of these students will persist and earn college degrees, however.

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Education and the Workplace

With the rising costs of higher education, various news headlines have asked if a college education is worth the cost. One way to

address this question is in terms of the earning potential associated with various levels of educational achievement. In 2016, the average earnings for Americans 25 and older with only a high school education was $35,615, compared with $65,482 for those with a bachelor's degree, compared with $92,525 for those with more advanced degrees. Average earnings vary by gender, race, and geographical location in the United States.

Of concern in recent years is the relationship between higher education and the workplace. In 2005, American educator and then Harvard University President, Derek Bok, called for a closer alignment between the goals of educators and the demands of the economy. Companies outsource much of their work, not only to save costs but to find workers with the skills they need. What is required to do well in today's economy? Colleges and universities, he argued, need to promote global awareness, critical thinking skills, the ability to communicate, moral reasoning, and responsibility in their students. Regional accrediting agencies and state organizations provide similar guidelines for educators. Workers need skills in listening, reading, writing, speaking, global awareness, critical thinking, civility, and computer literacy—all skills that enhance success in the workplace.

More than a decade later, the question remains: does formal education prepare young adults for the workplace? It depends on whom you ask. In an article referring to information from the National Association of Colleges and Employers' 2018 Job Outlook Survey, Bauer-Wolf (2018) explains that employers perceive gaps in students' competencies but many graduating college seniors are overly confident. The biggest difference was in perceived professionalism and work ethic (only 43 percent of employers thought that students are competent in this area compared to 90 percent of the students). Similar differences were also found in terms of oral communication, written communication, and critical thinking skills. Only in terms of digital technology skills were more employers confident about students' competencies than were the students (66 percent compared to 60 percent).

It appears that students need to learn what some call "soft skills," as well as the particular knowledge and skills within their college major. As education researcher Loni Bordoloi Pazich (2018) noted, most American college students today are enrolling in business or other pre-professional programs and to be effective and successful workers and leaders, they would benefit from the communication, teamwork, and critical thinking skills, as well as the content knowledge, gained from liberal arts education. In fact, two-thirds of children starting primary school now will be employed in jobs in the future that currently do not exist. Therefore, students cannot learn every single skill or fact that they may need to know, but they can learn how to learn, think, research, and communicate well so that they are prepared to continually learn new things and adapt effectively in their careers and lives since the economy, technology, and global markets will continue to evolve.

Career Choices in Early Adulthood

Hopefully, we are each becoming lifelong learners, particularly since we are living longer and will most likely change jobs multiple times during our lives. However, for many, our job changes will be within the same general occupational field, so our initial career choice is still significant. We've seen with Erikson that identity largely involves occupation and, as we will learn in the next section, Levinson found that young adults typically form a dream about work (though females may have to choose to focus relatively more on work or family initially with "split" dreams). The American School Counselor Association recommends that school counselors aid students in their career development beginning as early as kindergarten and continue this development throughout their education.

One of the most well-known theories about career choice is from John Holland (1985), who proposed that there are six personality

types (realistic, investigative, artistic, social, enterprising, and conventional), as well as varying types of work environments. The better matched one's personality is to the workplace characteristics, the more satisfied and successful one is predicted to be with that career or vocational choice. Research support has been mixed and we should note that there is more to satisfaction and success in a career than one's personality traits or likes and dislikes. For instance, education, training, and abilities need to match the expectations and demands of the job, plus the state of the economy, availability of positions, and salary rates may play practical roles in choices about work.

Link to Learning: What's Your Right Career?

To complete a free online career questionnaire and identify potential careers based on your preferences, go to:

Career One Stop Questionnaire

Did you find out anything interesting? Think of this activity as a starting point to your career exploration. Other great ways for young adults to research careers include informational interviewing, job shadowing, volunteering, practicums, and internships. Once you have a few careers in mind that you want to find out more about, go to the Occupational Outlook Handbook from the U.S. Bureau of Labor Statistics to learn about job tasks, required education, average pay, and projected outlook for the future.

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Cognitive Development in Middle Adulthood

While we sometimes associate aging with cognitive decline (often due to the way it is portrayed in the media), aging does not necessarily mean a decrease in cognitive function. In fact, tacit knowledge, verbal memory, vocabulary, inductive reasoning, and other types of practical thought skills *increase* with age. We'll learn about these advances as well as some neurological changes that happen in middle adulthood in the section that follows.

Cognition in Middle Adulthood

***Figure 1**. Remaining cognitively active can reduce cognitive decline.*

One of the most influential perspectives on cognition during middle adulthood has been that of the Seattle Longitudinal Study (SLS) of adult cognition, which began in 1956. Schaie & Willis (2010) summarized the general findings from this series of studies as follows: "We have generally shown that reliably replicable average age decrements in psychometric abilities do not occur prior to age 60, but that such reliable decrement can be found for all abilities by 74 years of age." In short, decreases in cognitive abilities begin in the sixth decade and gain increasing significance from that point on. However, Singh-Maoux et al (2012) argue for small but significant cognitive declines beginning as early as age 45. There is some evidence that

adults should be as aggressive in maintaining their cognitive health as they are their physical health during this time as the two are intimately related.

A second source of longitudinal research data on this part of the lifespan has been The Midlife in the United States Studies (MIDUS), which began in 1994. The MIDUS data supports the view that this period of life is something of a trade-off, with some cognitive and physical decreases of varying degrees. The cognitive mechanics of processing speed, often referred to as fluid intelligence, physiological lung capacity, and muscle mass, are in relative decline. However, knowledge, experience and the increased ability to regulate our emotions can compensate for these loses. Continuing cognitive focus and exercise can also reduce the extent and effects of cognitive decline.

Control Beliefs

Central to all of this is personal **control beliefs**, which have a long history in psychology. Beginning with the work of Julian Rotter (1954), a fundamental distinction is drawn between those who believe that they are the fundamental agent of what happens in their life, and those who believe that they are largely at the mercy of external circumstances. Those who believe that life outcomes are dependent on what they say and do are said to have a strong internal locus of control. Those who believe that they have little control over their life outcomes are said to have an external locus of control.

Empirical research has shown that those with an internal locus of control enjoy better results in psychological tests across the board; behavioral, motivational, and cognitive. It is reported that this belief in control declines with age, but again, there is a great deal of individual variation. This raises another issue: directional causality. Does my belief in my ability to retain my intellectual skills

and abilities at this time of life ensure better performance on a cognitive test compared to those who believe in their inexorable decline? Or, does the fact that I enjoy that intellectual competence or facility instill or reinforce that belief in control and controllable outcomes? It is not clear which factor is influencing the other. The exact nature of the connection between control beliefs and cognitive performance remains unclear.

Brain science is developing exponentially and will unquestionably deliver new insights on a whole range of issues related to cognition in midlife. One of them will surely be on the brain's capacity to renew, or at least replenish itself, at this time of life. The capacity to renew is called neuorgenesis; the capacity to replenish what is there is called neuroplasticity. At this stage it is impossible to ascertain exactly what effect future pharmacological interventions may have on possible cognitive decline at this, and later, stages of life.

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Cognitive Aging

Researchers have identified areas of loss and gain in cognition in older age. Cognitive ability and intelligence are often measured using standardized tests and validated measures. The psychometric approach has identified two categories of intelligence that show different rates of change across the life span (Schaie & Willis, 1996). Fluid and crystallized intelligence were first identified by Cattell in 1971. **Fluid intelligence** refers to information processing abilities, such as logical reasoning, remembering lists, spatial ability, and reaction time. **Crystallized intelligence** encompasses abilities that draw upon experience and knowledge. Measures of crystallized intelligence include vocabulary tests, solving number problems, and understanding texts. There is a general acceptance that fluid intelligence decreases continually from the 20s, but that crystallized intelligence continues to accumulate. One might expect to complete the NY Times crossword more quickly at 48 than 22, but the capacity to deal with novel information declines.

With age, systematic declines are observed on cognitive tasks requiring self-initiated, effortful processing, without the aid of supportive memory cues (Park, 2000). Older adults tend to perform poorer than young adults on memory tasks that involve recall of information, where individuals must retrieve information they learned previously without the help of a list of possible choices. For example, older adults may have more difficulty recalling facts such as names or contextual details about where or when something happened (Craik, 2000). What might explain these deficits as we age?

***Figure 2**. While typing speed and reaction time slow with age, older typists can compensate in other ways, by looking farther ahead at printed text.*

As we age, working memory, or our ability to simultaneously store and use information, becomes less efficient (Craik & Bialystok, 2006). The ability to process information quickly also decreases with age. This slowing of processing speed may explain age differences on many different cognitive tasks (Salthouse, 2004). Some researchers have argued that inhibitory functioning, or the ability to focus on certain information while suppressing attention to less pertinent information, declines with age and may explain age differences in performance on cognitive tasks (Hasher & Zacks, 1988).

Fewer age differences are observed when memory cues are available, such as for recognition memory tasks, or when individuals can draw upon acquired knowledge or experience. For example, older adults often perform as well if not better than young adults on tests of word knowledge or vocabulary. With age often comes expertise, and research has pointed to areas where aging experts perform as well or better than younger individuals. For example, older typists were found to compensate for age-related declines in speed by looking farther ahead at printed text (Salthouse, 1984). Compared to younger players, older chess experts are able to focus on a smaller set of possible moves, leading to greater cognitive efficiency (Charness, 1981). Accrued knowledge of everyday tasks, such as grocery prices, can help older adults to make better decisions than young adults (Tentori, Osheron, Hasher, & May, 2001).

We began with Schaie and Willis (2010) observing that no discernible general cognitive decline could be observed before 60, but other studies contradict this notion. How do we explain this contradiction? In a thought-provoking article, Ramscar et al (2014) argued that an emphasis on information processing speed ignored the effect of the process of learning/experience itself; that is, that such tests ignore the fact that more information to process leads to slower processing in both computers and humans. We are more complex cognitive systems at 55 than 25.

Watch It

This video highlights some of the cognitive changes during adulthood as well as the characteristics that either decline, improve, or remain stable.

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Performance in Middle Adulthood

Research on interpersonal problem solving suggests that older adults use more effective strategies than younger adults to navigate through social and emotional problems (Blanchard-Fields, 2007). In the context of work, researchers rarely find that older individuals perform less well on the job (Park & Gutchess, 2000). Similar to everyday problem solving, older workers may develop more efficient strategies and rely on expertise to compensate for cognitive decline.

Empirical studies of cognitive aging are often difficult, and quite technical, given their nature. Similarly, experiments focused on one kind of task may tell you very little in terms of general capacities. Memory and attention as psychological constructs are now divided into very specific subsets which can be confusing and difficult to compare.

However, one study does show with relative clarity the issues involved. In the USA, The Federal Aviation Authority insists that all air traffic controllers retire at 56 and that they cannot begin until age 31 unless they have previous military experience. However, in Canada controllers are allowed to work until aged 65 and are allowed to train at a much earlier age. Nunes and Kramer (2009)

studied four groups: a younger group of controllers (20-27), an older group of controllers aged 53 to 64, and two other groups of the same age who were not air traffic controllers. On simple cognitive tasks, not related to their occupational lives as controllers, older controllers were slower than their younger peers. However, when it came to job-related tasks their results were largely identical. This was not true of the older group of non-controllers who had significant deficits in comparison. Specific knowledge or expertise in a domain acquired over time (crystallized intelligence), can offset a decline in fluid intelligence.

Tacit Knowlege

The idea of **tacit knowledge** was first introduced by Michael Polanyi (1954). He argued that each individual had a huge store of knowledge based on life experience, but that it was often difficult to describe, codify, and thus transfer, as stated in his famous formulation, "we always know more than we can tell." Organizational theorists have spent a great deal of time thinking about the problem of tacit knowledge in this setting. Think of someone you have encountered who is extremely good at what they do. They may have no more (or less) education, formal training, and even experience, than others who are supposedly at an equivalent level. What is the "something" that they have? Tacit knowledge is highly prized and older workers often have the greatest amount, even if they are not conscious of that fact.

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Cognitive Development in Late Adulthood

There are numerous stereotypes regarding older adults as being forgetful and confused, but what does the research on memory and cognition in late adulthood actually reveal? In this section, we will focus upon the impact of aging on memory, how age impacts cognitive functioning, and abnormal memory loss due to Alzheimer's disease, delirium, and dementia.

Cognitive Development and Memory in Late Adulthood

How does aging affect memory?

The Sensory Register

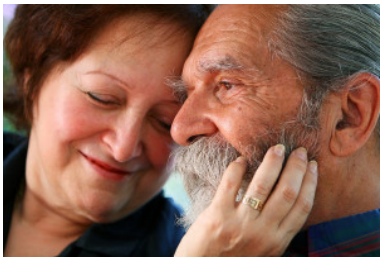

***Figure 1**. During late adulthood, memory and attention decline, but continued efforts to learn and engage in cognitive activities can minimize aging effects on cognitive development.*

Aging may create small decrements in the sensitivity of the senses. And, to the extent that a person has a more difficult time hearing or seeing, that information will not be stored in memory. This is an important point, because many older people assume that if they cannot remember something, it is

because their memory is poor. In fact, it may be that the information was never seen or heard.

The Working Memory

Older people have more difficulty using memory strategies to recall details (Berk, 2007). **Working memory** is a cognitive system with a limited capacity responsible for temporarily holding information available for processing. As we age, the working memory loses some of its capacity. This makes it more difficult to concentrate on more than one thing at a time or to remember details of an event. However, people often compensate for this by writing down information and avoiding situations where there is too much going on at once to focus on a particular cognitive task.

When an elderly person demonstrates difficulty with multi-step verbal information presented quickly, the person is exhibiting problems with working memory. Working memory is among the cognitive functions most sensitive to decline in old age. Several explanations have been offered for this decline in memory functioning; one is the processing speed theory of cognitive aging by Tim Salthouse. Drawing on the findings of general slowing of cognitive processes as people grow older, Salthouse argues that slower processing causes working-memory contents to decay, thus reducing effective capacity. For example, if an elderly person is watching a complicated action movie, they may not process the events quickly enough before the scene changes, or they may processing the events of the second scene, which causes them to forget the first scene. The decline of working-memory capacity cannot be entirely attributed to cognitive slowing, however, because capacity declines more in old age than speed.

Another proposal is the inhibition hypothesis advanced by Lynn Hasher and Rose Zacks. This theory assumes a general deficit in old age in the ability to inhibit irrelevant, or no-longer relevant,

information. Therefore, working memory tends to be cluttered with irrelevant contents which reduce the effective capacity for relevant content. The assumption of an inhibition deficit in old age has received much empirical support but, so far, it is not clear whether the decline in inhibitory ability fully explains the decline of working-memory capacity.

An explanation on the neural level of the decline of working memory and other cognitive functions in old age was been proposed by Robert West. He argued that working memory depends to a large degree on the pre-frontal cortex, which deteriorates more than other brain regions as we grow old. Age related decline in working memory can be briefly reversed using low intensity transcranial stimulation, synchronizing rhythms in bilateral frontal and left temporal lobe areas.

The Long-Term Memory

Long-term memory involves the storage of information for long periods of time. Retrieving such information depends on how well it was learned in the first place rather than how long it has been stored. If information is stored effectively, an older person may remember facts, events, names and other types of information stored in long-term memory throughout life. The memory of adults of all ages seems to be similar when they are asked to recall names of teachers or classmates. And older adults remember more about their early adulthood and adolescence than about middle adulthood (Berk, 2007). Older adults retain semantic memory or the ability to remember vocabulary.

Younger adults rely more on mental rehearsal strategies to store and retrieve information. Older adults focus rely more on external cues such as familiarity and context to recall information (Berk, 2007). And they are more likely to report the main idea of a story rather than all of the details (Jepson & Labouvie-Vief, in Berk, 2007).

A positive attitude about being able to learn and remember plays an important role in memory. When people are under stress (perhaps feeling stressed about memory loss), they have a more difficult time taking in information because they are preoccupied with anxieties. Many of the laboratory memory tests require comparing the performance of older and younger adults on timed memory tests in which older adults do not perform as well. However, few real life situations require speedy responses to memory tasks. Older adults rely on more meaningful cues to remember facts and events without any impairment to everyday living.

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New Research on Aging and Cognition

Can the brain be trained in order to build cognitive reserve to

reduce the effects of normal aging? ACTIVE (Advanced Cognitive Training for Independent and Vital Elderly), a study conducted between 1999 and 2001 in which 2,802 individuals age 65 to 94, suggests that the answer is "yes." These participants received 10 group training sessions and 4 follow up sessions to work on tasks of memory, reasoning, and speed of processing. These mental workouts improved cognitive functioning even 5 years later. Many of the participants believed that this improvement could be seen in everyday tasks as well (Tennstedt, Morris, et al, 2006). Learning new things, engaging in activities that are considered challenging, and being physically active at any age may build a reserve to minimize the effects of primary aging of the brain.

WAtch It

Watch this video from SciShow Psych to learn about ways to keep the mind young and active.

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Wisdom

Wisdom is the ability to use common sense and good judgment in making decisions. A wise person is insightful and has knowledge that can be used to overcome obstacles they encounter in their daily lives. Does aging bring wisdom? While living longer brings experience, it does not always bring wisdom. Those who have had experience helping others resolve problems in living and those who have served in leadership positions seem to have more wisdom. So it is age combined with a certain type of experience that brings wisdom. However, older adults generally have greater emotional wisdom or the ability to empathize with and understand others.

Changes in Attention in Late Adulthood

Divided attention has usually been associated with significant age-related declines in performing complex tasks. For example, older adults show significant impairments on attentional tasks such as looking at a visual cue at the same time as listening to an auditory cue because it requires dividing or switching of attention among multiple inputs. Deficits found in many tasks, such as the Stroop task which measures selective attention, can be largely attributed to a general slowing of information processing in older adults rather than to selective attention deficits per se. They also are able to maintain concentration for an extended period of time. In general, older adults are *not* impaired on tasks that test sustained attention, such as watching a screen for an infrequent beep or symbol.

The tasks on which older adults show impairments tend to be those that require flexible control of attention, a cognitive function

associated with the frontal lobes. Importantly, these types of tasks appear to improve with training and can be strengthened.

An important conclusion from research on changes in cognitive function as we age is that attentional deficits can have a significant impact on an older person's ability to function adequately and independently in everyday life. One important aspect of daily functioning impacted by attentional problems is driving. This is an activity that, for many older people, is essential to independence. Driving requires a constant switching of attention in response to environmental contingencies. Attention must be divided between driving, monitoring the environment, and sorting out relevant from irrelevant stimuli in a cluttered visual array. Research has shown that divided attention impairments are significantly associated with increased automobile accidents in older adults. Therefore, practice and extended training on driving simulators under divided attention conditions may be an important remedial activity for older people.

Problem Solving

Problem solving tasks that require processing non-meaningful information quickly (a kind of task which might be part of a laboratory experiment on mental processes) declines with age. However, real life challenges facing older adults do not rely on speed of processing or making choices on one's own. Older adults are able to resolve everyday problems by relying on input from others such as family and friends. They are also less likely than younger adults to delay making decisions on important matters such as medical care (Strough et al., 2003; Meegan & Berg, 2002).

Try It

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Cognitive Function in Late Adulthood

Abnormal Loss of Cognitive Functioning During Late Adulthood

Dementia is the umbrella category use to describe the general long-term and often gradual decrease in the ability to think and remember that affects a person's daily functioning.The manual used to help classify and diagnose mental disorders, the Diagnostic and Statistical Manual of Mental Disorders, or DSM-V, classifies dementia as "major neurocognitive disorder, with milder symptoms classified as "mild cognitive impairment," although the term dementia is still in common use. Common symptoms of dementia

include emotional problems, difficulties with language, and a decrease in motivation. A person's consciousness is usually not affected. Globally, dementia affected about 46 million people in 2015. About 10% of people develop the disorder at some point in their lives, and it becomes more common with age. About 3% of people between the ages of 65–74 have dementia, 19% between 75 and 84, and nearly half of those over 85 years of age. In 2015, dementia resulted in about 1.9 million deaths, up from 0.8 million in 1990. As more people are living longer, dementia is becoming more common in the population as a whole.

Dementia generally refers to severely impaired judgment, memory or problem-solving ability. It can occur before old age and is not an inevitable development even among the very old. Dementia can be caused by numerous diseases and circumstances, all of which result in similar general symptoms of impaired judgment, etc. Alzheimer's disease is the most common form of dementia and is incurable, but there are also nonorganic causes of dementia which can be prevented. Malnutrition, alcoholism, depression, and mixing medications can also result in symptoms of dementia. If these causes are properly identified, they can be treated. Cerebral vascular disease can also reduce cognitive functioning.

Delirium, also known as acute confusional state, is an organically caused decline from a previous baseline level of mental function that develops over a short period of time, typically hours to days. It is more common in older adults, but can easily be confused with a number of psychiatric disorders or chronic organic brain syndromes because of many overlapping signs and symptoms in common with dementia, depression, psychosis, etc. Delirium may manifest from a baseline of existing mental illness, baseline intellectual disability, or dementia, without being due to any of these problems.

Delirium is a syndrome encompassing disturbances in attention, consciousness, and cognition. It may also involve other neurological deficits, such as psychomotor disturbances (e.g. hyperactive,

hypoactive, or mixed), impaired sleep-wake cycle, emotional disturbances, and perceptual disturbances (e.g. hallucinations and delusions), although these features are not required for diagnosis. Among older adults, delirium occurs in 15-53% of post-surgical patients, 70-87% of those in the ICU, and up to 60% of those in nursing homes or post-acute care settings. Among those requiring critical care, delirium is a risk for death within the next year.

Alzheimer's Disease

Alzheimer's disease (AD), also referred to simply as Alzheimer's, is the most common cause of dementia, accounting for 60-70% of its cases. Alzheimer's is a progressive disease causing problems with memory, thinking and behavior. Symptoms usually develop slowly and get worse over time, becoming severe enough to interfere with daily tasks.

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Video 1. *What is Alzheimer's Disease?*

The most common early symptom is difficulty in remembering recent events. As the disease advances, symptoms can include problems with language, disorientation (including easily getting lost), mood swings, loss of motivation, not managing self care, and behavioral issues. In the early stages, memory loss is mild, but with

late-stage Alzheimer's, individuals lose the ability to carry on a conversation and respond to their environment.

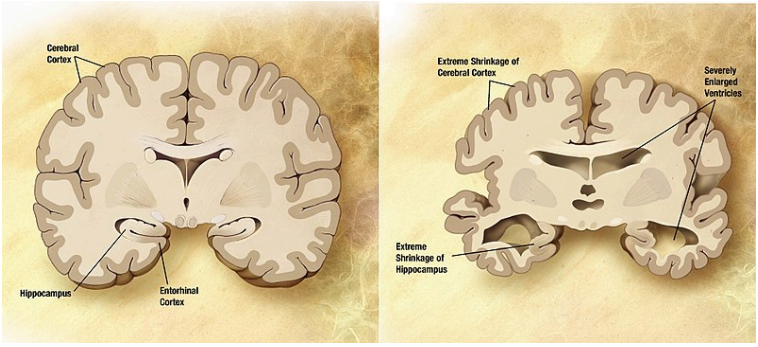

***Figure 2**. Alzheimer's disease is not simply part of the aging process. It is a disease with physiological symptoms and decay in the brain.*

Alzheimer's is the sixth leading cause of death in the United States. On average, a person with Alzheimer's lives four to eight years after diagnosis, but can live as long as 20 years, depending on other factors. Alzheimer's is not a normal part of aging. The greatest known risk factor is increasing age, and the majority of people with Alzheimer's are 65 and older. But Alzheimer's is not just a disease of old age. Approximately 200,000 Americans under the age of 65 have younger-onset Alzheimer's disease (also known as early-onset Alzheimer's).

The cause of Alzheimer's disease is poorly understood. About 70% of the risk is believed to be inherited from a person's parents with many genes usually involved. Other risk factors include a history of head injuries, depression, and hypertension. The disease process is associated with plaques and neurofibrillary tangles in the brain. A probable diagnosis is based on the history of the illness and cognitive testing with medical imaging and blood tests to rule out other possible causes. Initial symptoms are often mistaken for normal aging, but examination of brain tissue, specifically of structures called plaques and tangles, is needed for a definite

diagnosis. Though qualified physicians can be up to 90% certain of a correct diagnosis of Alzheimer's, currently, the only way to make a 100% definitive diagnosis is by performing and autopsy of the person and examining the brain tissue. In 2015, there were approximately 29.8 million people worldwide with AD. In developed countries, AD is one of the most financially costly diseases.

Watch It

Video 2. This new report demonstrates an Alzheimer's simulation meant to help families better understand what a person with the disease may experience in their day-to-day lives.

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Glossary

dialectical thought: the ability to reason from multiple perspectives and synthesize various viewpoints in order to come up with new ideas

dualism: absolute, black and white, right and wrong type of thinking

multiplicity: recognizing that some problems are solvable and some answers are not yet known

postformal thought: a more individualistic and realistic type of thinking that occurs after Piaget's last stage of formal operations

relativism: understanding the importance of the specific context of knowledge—it's all relative to other factors

control beliefs: the belief that an individual can influence life outcomes, encompassing estimations of relevant external constraints and our own capabilities

crystallized intelligence: knowledge, skills, and experience acquired over a lifetime, accessible via memory and expressible in word/number form

fluid intelligence: the ability to recognize patterns and solve problems, irrespective of any past experience of the context in which these patterns or problems arise

tacit knowledge: pragmatic or practical and learned through experience rather than explicitly taught

Alzheimer's disease: an irreversible, progressive brain disorder that slowly destroys memory and thinking skills, and eventually the ability to carry out the simplest tasks

delirium: an abrupt change in the brain that causes mental confusion and emotional disruption. It makes it difficult to think, remember, sleep, pay attention, and more

dementia: a cause of neurocognitive disorder, characterized by progressive and gradual cognitive deficits due to severe cerebral atrophy

long-term memory: the storage of information over an extended period[/glossary-definition]

working memory: a cognitive system with a limited capacity that is responsible for temporarily holding information available for processing

PSYCHOSOCIAL DEVELOPMENT IN ADULTHOOD

Learning Objectives

- Describe Erikson's stage of intimacy vs. isolation
- Summarize Levinson's theory of early adulthood transitions
- Describe some of the factors related to attraction in relationships
- Apply Sternberg's theory of love to relationships
- Summarize attachment theory in adulthood
- Describe trends and norms in dating, cohabitation, and marriage in the United States
- Describe challenges, transitions, and factors associated with parenthood
- Describe Erikson's stage of generativity vs. stagnation
- Evaluate Levinson's notion of the midlife crisis
- Examine key theories on aging, including socio-emotional selectivity theory (SSC) and selection, optimization, and compensation (SOC)
- Describe personality and work-related issues in midlife
- Describe the link between intimacy and subjective well-being

- Discuss issues related to family life in middle adulthood
- Discuss divorce and recoupling during middle adulthood
- Describe theories related to late adulthood, including Erikson's psychosocial stage of integrity vs. despair
- Describe examples of productivity in late adulthood
- Describe attitudes about aging
- Examine family relationships during late adulthood (grandparenting, marriage, divorce, widowhood, traditional and non-traditional roles; co-habitation, LGBTQ+)

When we are children and teens, we eagerly anticipate each and every birthday, waiting for the next big one…when we'll finally be grown up and have all the freedoms and rights enjoyed by those who are older than us. Indeed, there are opportunities to drive, buy a car, vote, go to college, join the military, drink, move out on our own, date, live together, get married, work, have children, buy a house, and more. This can be an awesome time in our lives, as we tend to be physically and cognitively strong and healthy, we dream and make plans for the future, find people to share our experiences, and try out new roles. It can also be challenging, stressful, and scary as we realize that a lot of responsibility comes with such freedom. We have probably all seen the coffee mugs that proclaim, "Adulting is hard," or the t-shirts that announce, "I can't adult today" (typically worn by young adults!).

Development is a process, and we aren't suddenly adults at a certain age. In fact, we may even take longer to grow up these days. In this module, we'll learn about norms, trends, and theories about why certain patterns are forming. It's even been proposed

that there is a new stage of development between adolescence and early adulthood, called "emerging adulthood," when young people don't quite feel like they are adults yet and wait longer to join the workforce, move out on their own, get married, and have children. Yet by the end of early adulthood, most of us will have accomplished the important developmental tasks of becoming more autonomous, taking care of ourselves and even others, committing to relationships and jobs/careers, getting married, raising families, and becoming part of our communities. There are, of course, many individual and cultural differences.

Think of your own life. When will you feel like an adult? Or do you already feel like an adult? Why or why not? Did your parents become adults earlier or later in their lives, compared to you?

Theories of Adult Psychosocial Development

From a lifespan developmental perspective, growth and development do not stop in childhood or adolescence; they continue throughout adulthood. In this section, we will build on Erikson's psychosocial stages, then be introduced to theories about transitions that occur during adulthood. According to Levinson, we alternate between periods of change and periods of stability. More recently, Arnett notes that transitions to adulthood happen at later ages than in the past and he proposes that there is a new stage between adolescence and early adulthood called, "emerging adulthood." Let's see what you think.

Erikson's Theory

Intimacy vs. Isolation

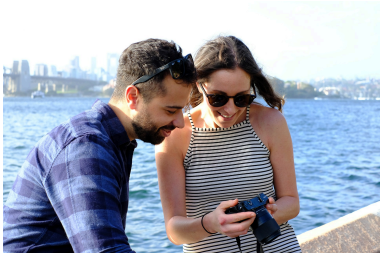

***Figure 1**. Young adulthood is a time to connect with others in both friendships and romantic relationships.*

Erikson (1950) believed that the main task of early adulthood is to establish intimate relationships and not feel isolated from others. Intimacy does not necessarily involve romance; it involves caring about another and sharing one's self without losing one's self. This developmental crisis of "intimacy versus isolation" is affected by how the adolescent crisis of "identity versus role confusion" was resolved (in addition to how the earlier developmental crises in infancy and childhood were resolved). The young adult might be afraid to get too close to someone else and lose her or his sense of self, or the young adult might define her or himself in terms of another person. Intimate relationships are more difficult if one is still struggling with identity. Achieving a sense of identity is a life-long process, but there are periods of identity crisis and stability. And, according to Erikson, having some sense of identity is essential for intimate relationships. Although, consider what that would mean for previous generations of women who may have defined themselves through their husbands and marriages, or for Eastern cultures today that value interdependence rather than independence.

Friendships as a source of intimacy

***Figure 2**. Many young adulthoods find intimacy through friendships rather than through committed romantic relationships. The increase of young adults attending college has contributed to this trend.*

In our twenties, intimacy needs may be met in friendships rather than with partners. This is especially true in the United States today as many young adults postpone making long-term commitments to partners either in marriage or in cohabitation. The kinds of friendships shared by women tend to differ from those shared by men (Tannen,1990). Friendships between men are more likely to involve sharing information, providing solutions, or focusing on activities rather than discussing problems or emotions. Men tend to discuss opinions or factual information or spend time together in an activity of mutual interest. Friendships between women are more likely to focus on sharing weaknesses, emotions, or problems. Women talk about difficulties they are having in other relationships and express their sadness, frustrations, and joys. These differences in approaches could lead to problems when men and women come together. She may want to vent about a problem she is having; he may want to provide a solution and move on to some activity. But when he offers a solution, she thinks he does not care! Effective communication is the key to good relationships.

Many argue that other-sex friendships become more difficult for heterosexual men and women because of the unspoken question about whether the friendships will lead to a romantic involvement. Although common during adolescence and early adulthood, these friendships may be considered threatening once a person is in a long-term relationship or marriage. Consequently, friendships may

diminish once a person has a partner or single friends may be replaced with couple friends.

Gaining Adult Status

Many of the developmental tasks of early adulthood involve becoming part of the adult world and gaining independence. Young adults sometimes complain that they are not treated with respect, especially if they are put in positions of authority over older workers. Consequently, young adults may emphasize their age to gain credibility from those who are even slightly younger. "You're only 23? I'm 27!" a young adult might exclaim. [Note: This kind of statement is much less likely to come from someone in their 40s!]

The focus of early adulthood is often on the future. Many aspects of life are on hold while people go to school, go to work, and prepare for a brighter future. There may be a belief that the hurried life now lived will improve 'as soon as I finish school' or 'as soon as I get promoted' or 'as soon as the children get a little older.' As a result, time may seem to pass rather quickly. The day consists of meeting many demands that these tasks bring. The incentive for working so hard is that it will all result in a better future.

Try It

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Levinson's Theory

In 1978, Daniel Levinson published a book entitled, *The Seasons of a Man's Life* in which he presented a theory of development in adulthood. Levinson's work was based on in-depth interviews with 40 men between the ages of 35-45. According to Levinson, young adults have an image of the future that motivates them. This image is called "the dream" and for the men interviewed, it was a dream of how their career paths would progress and where they would be at midlife. Dreams are very motivating. Dreams of a home bring excitement to couples as they look, save, and fantasize about how life will be. Dreams of careers motivate students to continue in school as they fantasize about how much their hard work will pay off. Dreams of playgrounds on a summer day inspire would-be parents. A dream is perfect and retains that perfection as long as

it remains in the future. But as the realization of it moves closer, it may or may not measure up to its image. If it does, all is well. But if it does not, the image must be replaced or modified. And so, in adulthood, plans are made, efforts follow, and plans are reevaluated. This creating and recreating characterizes Levinson's theory. (The shift from idealistic dreams to more realistic experiences might remind us of the cognitive development progression from formal to postformal thought in adulthood.)

Levinson's stages (at least up to midlife) are presented below (Levinson, 1978). He suggested that periods of transition last about five years and periods of stability last about seven years. The ages presented below are based on life in the middle-class several decades ago. Think about how these ages and transitions might be different today, or in other cultures, or for women compared to men.

- Early adult transition (17-22): Leaving home, leaving family; making first choices about career and education
- Entering the adult world (22-28): Committing to an occupation, defining goals, finding intimate relationships
- Age 30 transition (28-33): Reevaluating those choices and perhaps making modifications or changing one's attitude toward love and work
- Settling down (33 to 40): Reinvesting in work and family commitments; becoming involved in the community
- Midlife transition (40-45): Reevaluating previous commitments; making dramatic changes if necessary; giving expression to previously ignored talents or aspirations; feeling more of a sense of urgency about life and its meaning
- Entering middle adulthood (45-50): Committing to new choices made and placing one's energies into these commitments

Nearly twenty years after his original research, Levinson interviewed 45 women ages 35-45 and published the book, *The seasons of a woman's life*. He reported similar patterns with women,

although women held a "split dream"—an image of the future in both work and family life and a concern with the timing and coordination of the two. Traditionally, by working outside the home, men were seen as taking care of their families. However, for women, working outside the home and taking care of their families were perceived as separate and competing for their time and attention. Hence, one aspect of the women's dreams was focused on one goal for several years and then their time and attention shifted towards the other, often resulting in delays in women's career dreams.

Figure 3. *Women are often torn between caring for their families and advancing their careers outside of the home.*

Adulthood, then, is a period of building and rebuilding one's life. Many of the decisions that are made in early adulthood are made before a person has had enough experience to really understand the consequences of such decisions. And, perhaps, many of these initial decisions are made with one goal in mind – to be seen as an adult. As a result, early decisions may be driven more by the expectations of others. For example, imagine someone who chose a career path based on other's advice but now finds that the job is not what was expected.

The age 30 transition may involve recommitting to the same job,

not because it's stimulating, but because it pays well; or the person may decide to go back to school and change careers. Settling down may involve settling down with a new set of expectations. As the adult gains status, he or she may be freer to make more independent choices. And sometimes these are very different from those previously made. The midlife transition differs from the age 30 transition in that the person is more aware of how much time has gone by and how much time is left. This brings a sense of urgency and impatience about making changes. The future focus of early adulthood gives way to an emphasis on the present in midlife–we will explore this in our next module. Overall, Levinson calls our attention to the dynamic nature of adulthood.

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Arnett's Theory of Emerging Adulthood

Have you noticed that many young adults in our society today are taking longer to accomplish the early adulthood developmental tasks of becoming independent? If so, you're not alone. Jeffrey Arnett (2000) pointed out this prolonged transitional period and described it as "emerging adulthood."

The theory of **emerging adulthood** proposes that a new life stage has arisen between adolescence and young adulthood over the past half-century in industrialized countries. Fifty years ago, most young people in these countries had entered stable adult roles in love and work by their late teens or early twenties. Relatively few people pursued education or training beyond secondary school, and, consequently, most young men were full-time workers by the end of their teens. Relatively few women worked in occupations outside the home, and the median marriage age for women in the United States and in most other industrialized countries in 1960 was around 20 (Arnett & Taber, 1994; Douglass, 2005). The median marriage age for men was around 22, and married couples usually had their first child about one year after their wedding day. All told, for most young people half a century ago, their teenage adolescence led quickly and directly to stable adult roles in love and work by their late teens or early twenties. These roles would form the structure of their adult lives for decades to come.

***Figure 4**. The years of emerging adulthood are often times of identity exploration through work, fashion, music, education, and other venues. [Image: CC0 Public Domain, https://goo.gl/m25gce]*

Now all that has changed. A higher proportion of young people

than ever before—about 70% in the United States—pursue education and training beyond secondary school (National Center for Education Statistics, 2012). The early twenties are not a time of entering stable adult work but a time of immense job instability: In the United States, the average number of job changes from ages 20 to 29 is seven. The median age of entering marriage in the United States is now 27 for women and 29 for men (U.S. Bureau of the Census, 2011). Consequently, a new stage of the life span, emerging adulthood, has been created, lasting from the late teens through the mid-twenties, roughly ages 18 to 25.

Five features make emerging adulthood distinctive:

- identity exploration,
- instability,
- self-focus,
- feeling in-between adolescence and adulthood,
- a sense of broad possibilities for the future.

If the years 18-25 are classified as "young adulthood," Arnett believes it is then difficult to find an appropriate term for the thirties. Emerging adults are still in the process of obtaining an education, are unmarried, and are childless. By age thirty, most of these individuals do see themselves as adults, based on the belief that they have more fully formed "individualistic qualities of character" such as self-responsibility, financial independence, and independence in decision-making. Arnett suggests that many of the individualistic characteristics associated with adult status correlate to, but are not dependent upon the role responsibilities with a career, marriage, and/or parenthood.

Whether or not "emerging adulthood" is considered to be a distinct developmental stage, it can be a useful concept in discussing developmental patterns in early adulthood in our culture today.

Watch It

To hear about emerging adulthood and why it takes longer to reach adulthood today, view this video clip of Dr. Jeffrey Arnett. In the first 6 1/2 minutes, he describes four societal revolutions that may have caused emerging adulthood. In the second half of the clip, Arnett discusses how "30 is the new 20," as twenty-somethings today enjoy unparalleled freedoms when compared with other generations.

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Is Emerging Adulthood a Global Phenomenon?

The five features proposed in the theory of emerging adulthood originally were based on research involving about 300 Americans between ages 18 and 29 from various ethnic groups, social classes, and geographical regions (Arnett, 2004). To what extent does the theory of emerging adulthood apply internationally?

The answer to this question depends greatly on what part of the world is considered. Demographers make a useful distinction between the developing countries that comprise the majority of the world's population and the economically developed countries that are part of the Organization for Economic Co-operation and Development (OECD), including the United States, Canada, western Europe, Japan, South Korea, Australia, and New Zealand. The current population of OECD countries (also called developed countries) is 1.2 billion, about 18% of the total world population (UNDP, 2011). The rest of the human population resides in developing countries, which have much lower median incomes; much lower median educational attainment; and much higher incidence of illness, disease, and early death. Let us consider emerging adulthood in OECD countries first, then in developing countries.

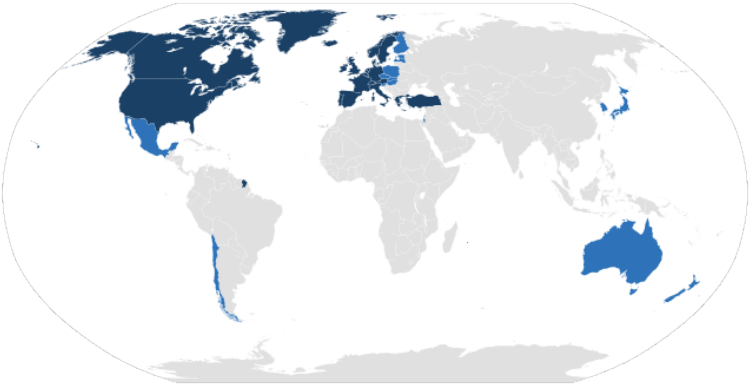

Figure 5. *Map of OECD countries. Darker shaded countries are original members. [Image: Parastscilveks, https://goo.gl/Mlvm0Y, CC BY-SA 2.0, https://goo.gl/eH69he]*

The same demographic changes as described above for the United States have taken place in other OECD countries as well. This is true of participation in postsecondary education as well as median ages for entering marriage and parenthood (UNdata, 2010). However,

there is also substantial variability in how emerging adulthood is experienced across OECD countries. Europe is the region where emerging adulthood is longest and most leisurely. The median ages for entering marriage and parenthood are near 30 in most European countries (Douglass, 2007). Europe today is the location of the most affluent, generous, and egalitarian societies in the world—in fact, in human history (Arnett, 2007). Governments pay for tertiary education, assist young people in finding jobs, and provide generous unemployment benefits for those who cannot find work. In northern Europe, many governments also provide housing support. Emerging adults in European societies make the most of these advantages, gradually making their way to adulthood during their twenties while enjoying travel and leisure with friends.

The lives of Asian emerging adults in developed countries such as Japan and South Korea are in some ways similar to the lives of emerging adults in Europe and in some ways strikingly different. Like European emerging adults, Asian emerging adults tend to enter marriage and parenthood around age 30 (Arnett, 2011). Like European emerging adults, Asian emerging adults in Japan and South Korea enjoy the benefits of living in affluent societies with generous social welfare systems that provide support for them in making the transition to adulthood—for example, free university education and substantial unemployment benefits.

However, in other ways, the experience of emerging adulthood in Asian OECD countries is markedly different than in Europe. Europe has a long history of individualism, and today's emerging adults carry that legacy with them in their focus on self-development and leisure during emerging adulthood. In contrast, Asian cultures have a shared cultural history emphasizing collectivism and family obligations. Although Asian cultures have become more individualistic in recent decades as a consequence of globalization, the legacy of collectivism persists in the lives of emerging adults. They pursue identity explorations and self-development during emerging adulthood, like their American and European counterparts, but within narrower boundaries set by their sense

of obligations to others, especially their parents (Phinney & Baldelomar, 2011). For example, in their views of the most important criteria for becoming an adult, emerging adults in the United States and Europe consistently rank financial independence among the most important markers of adulthood. In contrast, emerging adults with an Asian cultural background especially emphasize becoming capable of supporting parents financially as among the most important criteria (Arnett, 2003; Nelson, Badger, & Wu, 2004). This sense of family obligation may curtail their identity explorations in emerging adulthood to some extent, as they pay more heed to their parents' wishes about what they should study, what job they should take, and where they should live than emerging adults do in the West (Rosenberger, 2007).

Another notable contrast between Western and Asian emerging adults is in their sexuality. In the West, premarital sex is normative by the late teens, more than a decade before most people enter marriage. In the United States and Canada, and in northern and eastern Europe, cohabitation is also normative; most people have at least one cohabiting partnership before marriage. In southern Europe, cohabiting is still taboo, but premarital sex is tolerated in emerging adulthood. In contrast, both premarital sex and cohabitation remain rare and forbidden throughout Asia. Even dating is discouraged until the late twenties when it would be a prelude to a serious relationship leading to marriage. In cross-cultural comparisons, about three-fourths of emerging adults in the United States and Europe report having had premarital sexual relations by age 20, versus less than one-fifth in Japan and South Korea (Hatfield and Rapson, 2006).

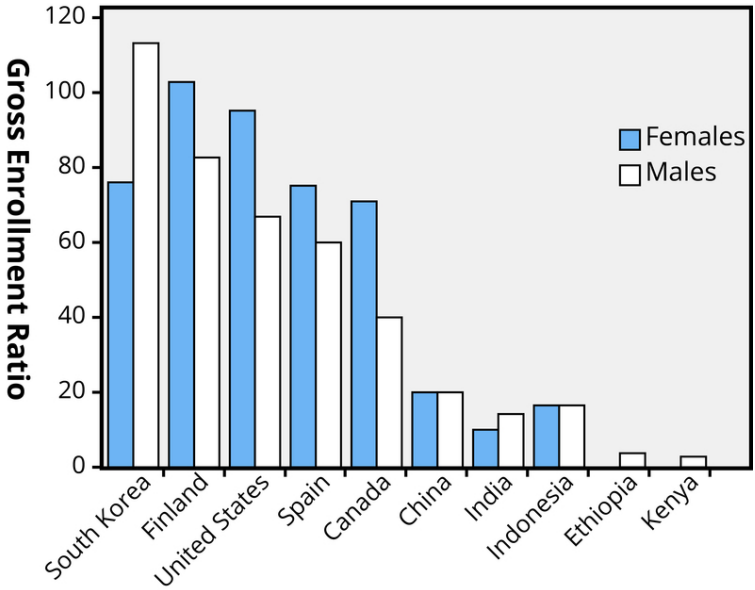

Figure 6. *Gross tertiary enrollment, selected countries, 2007. Source: UNdata (2010). Note. Gross enrollment ratio is the total enrollment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year. For the tertiary level, the population used is that of the five-year age group following the end of secondary schooling.*

For young people in developing countries, emerging adulthood exists only for the wealthier segment of society, mainly the urban middle class, whereas the rural and urban poor—the majority of the population—have no emerging adulthood and may even have no adolescence because they enter adult-like work at an early age and also begin marriage and parenthood relatively early. What Saraswathi and Larson (2002) observed about adolescence applies to emerging adulthood as well: "In many ways, the lives of middle-class youth in India, South East Asia, and Europe have more in common with each other than they do with those of poor youth in their own countries." However, as globalization proceeds, and economic development along with it, the proportion of young

people who experience emerging adulthood will increase as the middle class expands. By the end of the 21st century, emerging adulthood is likely to be normative worldwide.

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Relationships in Early Adulthood

We have learned from Erikson that the psychosocial developmental task of early adulthood is "intimacy versus isolation" and if resolved relatively positively, it can lead to the virtue of "love." In this section, we will look more closely at relationships in early adulthood, particularly in terms of love, dating, cohabitation, marriage, and parenting.

Attraction

Why do some people hit it off immediately? Or decide that the friend of a friend was not likable? Using scientific methods, psychologists have investigated factors influencing attraction and have identified a number of variables, such as similarity, proximity (physical or functional), familiarity, and reciprocity, that influence with whom we develop relationships.

Proximity

***Figure 1**. Great and important relationships can develop by chance and physical proximity helps. For example, seeing someone regularly on your daily bus commute to work or school may be all that's necessary to spark a genuine friendship. [Image: Cheri Lucas Rowlands, https://goo.gl/crCc0Q, CC BY-SA 2.0, https://goo.gl/rxiUsF]*

Often we "stumble upon" friends or romantic partners; this happens partly due to how close in proximity we are to those people. Specifically, **proximity** or *physical nearness* has been found to be a significant factor in the development of relationships. For example, when college students go away to a new school, they will make friends consisting of classmates, roommates, and teammates (i.e., people close in proximity). Proximity allows people the opportunity to get to know one other and discover their similarities—all of which can result in a friendship or intimate relationship. Proximity is not just about geographic distance, but rather functional distance, or the frequency with which we cross paths with others. For example, college students are more likely to become closer and develop relationships with people on their dorm-room floors because they see them (i.e., cross paths) more often than they see people on a different floor. How does the notion of proximity apply in terms of online relationships? Deb Levine (2000) argues that in terms of developing online relationships and attraction, functional distance refers to being at the same place at the same time in a virtual world (i.e., a chat room or Internet forum)—crossing virtual paths.

Familiarity

One of the reasons why proximity matters to attraction is that it breeds *familiarity*; people are more attracted to that which is familiar. Just being around someone or being repeatedly exposed to them increases the likelihood that we will be attracted to them. We also tend to feel safe with familiar people, as it is likely we know what to expect from them. Dr. Robert Zajonc (1968) labeled this phenomenon the mere-exposure effect. More specifically, he argued that the more often we are exposed to a stimulus (e.g., sound, person) the more likely we are to view that stimulus positively. Moreland and Beach (1992) demonstrated this by exposing a college class to four women (similar in appearance and age) who attended different numbers of classes, revealing that the more classes a woman attended, the more familiar, similar, and attractive she was considered by the other students.

There is a certain comfort in knowing what to expect from others; consequently, research suggests that we like what is familiar. While this is often on a subconscious level, research has found this to be one of the most basic principles of attraction (Zajonc, 1980). For example, a young man growing up with an overbearing mother may be attracted to other overbearing women *not* because he likes being dominated but rather because it is what he considers normal (i.e., familiar).

Similarity

When you hear about celebrity couples such as Kim Kardashian and Kanye West, do you shake your head thinking "this won't last"? It is probably because they seem so different. While many make the argument that opposites attract, research has found that is generally not true; s*imilarity* is key. Sure, there are times when

couples can appear fairly different, but overall we like others who are like us. Ingram and Morris (2007) examined this phenomenon by inviting business executives to a cocktail mixer, 95% of whom reported that they wanted to meet new people. Using electronic name tag tracking, researchers revealed that the executives did not mingle or meet new people; instead, they only spoke with those they already knew well (i.e., people who were similar).

When it comes to marriage, research has found that couples tend to be very similar, particularly when it comes to age, social class, race, education, physical attractiveness, values, and attitudes (McCann Hamilton, 2007; Taylor, Fiore, Mendelsohn, & Cheshire, 2011). This phenomenon is known as the **matching hypothesis** (Feingold, 1988; Mckillip & Redel, 1983). We like others who validate our points of view and who are similar in thoughts, desires, and attitudes.

Reciprocity

Another key component in attraction is **reciprocity**; this principle is based on the notion that we are more likely to like someone if they feel the same way toward us. In other words, it is hard to be friends with someone who is not friendly in return. Another way to think of it is that relationships are built on give and take; if one side is not reciprocating, then the relationship is doomed. Basically, we feel obliged to give what we get and to maintain equity in relationships. Researchers have found that this is true across cultures (Gouldner, 1960).

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Love

Figure 2. *Romantic relationships are so central to psychological health that most people in the world are or will be in a romantic relationship in their lifetime. [Image: CC0 Public Domain, https://goo.gl/m25gce]*

Is all love the same? Are there different types of love? Examining these questions more closely, Robert Sternberg's (2004; 2007) work has focused on the notion that all types of love are comprised of three distinct areas: intimacy, passion, and commitment. Intimacy includes caring, closeness, and emotional support. The passion component of love is comprised of physiological and emotional arousal; these can include physical attraction, emotional responses that promote physiological changes, and sexual arousal. Lastly, commitment refers to the cognitive process and decision to commit to love another person and the willingness to work to keep that love over the course of your life. The elements involved in intimacy (caring, closeness, and emotional support) are generally found in all types of close relationships—for example, a mother's love for a child or the love that friends share. Interestingly, this is not true for passion. Passion is unique to romantic love, differentiating friends from lovers. In sum, depending on the type of love and the stage of the relationship (i.e., newly in love), different combinations of these elements are present.

Taking this theory a step further, anthropologist Helen Fisher explained that she scanned the brains (using fMRI) of people who had just fallen in love and observed that their brain chemistry was "going crazy," similar to the brain of an addict on a drug high (Cohen, 2007). Specifically, serotonin production increased by as much as

40% in newly-in-love individuals. Further, those newly in love tended to show obsessive-compulsive tendencies. Conversely, when a person experiences a breakup, the brain processes it in a similar way to quitting a heroin habit (Fisher, Brown, Aron, Strong, & Mashek, 2009). Thus, those who believe that breakups are physically painful are correct! Another interesting point is that long-term love and sexual desire activate different areas of the brain. More specifically, sexual needs activate the part of the brain that is particularly sensitive to innately pleasurable things such as food, sex, and drugs (i.e., the striatum—a rather simplistic reward system), whereas love requires conditioning—it is more like a habit. When sexual needs are rewarded consistently, then love can develop. In other words, love grows out of positive rewards, expectancies, and habit (Cacioppo, Bianchi-Demicheli, Hatfield & Rapson, 2012).

Link to Learning

Dive deeper into Helen Fisher's research by watching her TED talk "The Brain in Love."

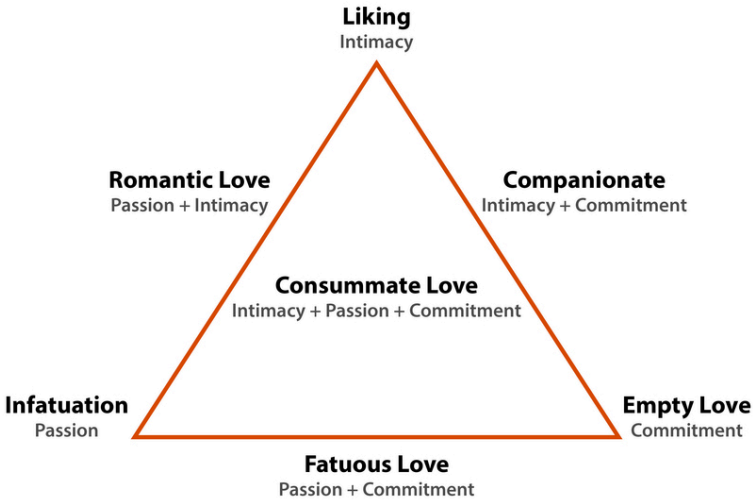

Figure 3. *The Triangular Theory of Love. Adapted from Wikipedia Creative Commons, 2013.*

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Attachment Theory in Adulthood

The need for intimacy, or close relationships with others, is universal and persistent across the lifespan. What our adult intimate relationships look like actually stems from infancy and our relationship with our primary caregiver (historically our mother)—a process of development described by attachment theory, which you learned about in the module on infancy. Recall that according to attachment theory, different styles of caregiving result in different relationship "attachments."

For example, responsive mothers—mothers who soothe their crying infants—produce infants who have secure attachments (Ainsworth, 1973; Bowlby, 1969). About 60% of all children are securely attached. As adults, secure individuals rely on their working models—concepts of how relationships operate—that were created in infancy, as a result of their interactions with their primary caregiver (mother), to foster happy and healthy adult intimate

relationships. Securely attached adults feel comfortable being depended on and depending on others.

As you might imagine, inconsistent or dismissive parents also impact the attachment style of their infants (Ainsworth, 1973), but in a different direction. In early studies on attachment style, infants were observed interacting with their caregivers, followed by being separated from them, then finally reunited. About 20% of the observed children were "resistant," meaning they were anxious even before, and especially during, the separation; and 20% were "avoidant," meaning they actively avoided their caregiver after separation (i.e., ignoring the mother when they were reunited). These early attachment patterns can affect the way people relate to one another in adulthood. Anxious-resistant adults worry that others don't love them, and they often become frustrated or angry when their needs go unmet. Anxious-avoidant adults will appear not to care much about their intimate relationships and are uncomfortable being depended on or depending on others themselves.

Table 1. Types of Early Attachment and Adult Intimacy

Secure	"I find it relatively easy to get close to others and am comfortable depending on them and having them depend on me. I don't often worry about being abandoned or about someone getting too close to me,"
Anxious-avoidant	"I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and often, love partners want me to be more intimate than I feel comfortable being."
Anxious-resistant	"I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to merge completely with another person, and this desire sometimes scares people away."

The good news is that our attachment can be changed. It isn't easy, but it is possible for anyone to "recover" a secure attachment. The process often requires the help of a supportive and dependable other, and for the insecure person to achieve coherence—the realization that his or her upbringing is not a permanent reflection of character or a reflection of the world at large, nor does it bar him or her from being worthy of love or others of being trustworthy (Treboux, Crowell, & Waters, 2004).

You can watch this video "What is Your Attachment Style?" from The School of Life to learn more.

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Applications of Sternberg's Theory

Click through the following interactive to review and apply Sternberg's theory.

https://h5p.org/h5p/embed/554153

Trends in Dating, Cohabitation, and Marriage

Dating

In general, traditional dating among teens and those in their early twenties has been replaced with more varied and flexible ways of getting together (and technology with social media, no doubt, plays a key role). The Friday night date with dinner and a movie that may still be enjoyed by those in their 30s gives way to less formal, more spontaneous meetings that may include several couples or a group of friends. Two people may get to know each other and go somewhere alone. How would you describe a "typical" date? Who calls, texts, or face times? Who pays? Who decides where to go? What is the purpose of the date? In general, greater planning is required for people who have additional family and work responsibilities.

Dating and the Internet

The ways people are finding love has changed with the advent of the Internet. In a poll, 49% of all American adults reported that either themselves or someone they knew had dated a person they met online (Madden & Lenhart, 2006). As Finkel and colleagues (2007) found, social networking sites, and the Internet generally, perform three important tasks. Specifically, sites provide individuals with access to a database of other individuals who are interested in meeting someone. Dating sites generally reduce issues of proximity, as individuals do not have to be close in proximity to meet. Also, they provide a medium in which individuals can communicate with others. Finally, some Internet dating websites advertise special matching strategies, based on factors such as personality, hobbies,

and interests, to identify the "perfect match" for people looking for love online. In general, scientific questions about the effectiveness of Internet matching or online dating compared to face-to-face dating remain to be answered.

It is important to note that social networking sites have opened the doors for many to meet people that they might not have ever had the opportunity to meet; unfortunately, it now appears that the social networking sites can be forums for unsuspecting people to be duped. In 2010 a documentary, Catfish, focused on the personal experience of a man who met a woman online and carried on an emotional relationship with this person for months. As he later came to discover, though, the person he thought he was talking and writing with did not exist. As Dr. Aaron Ben-Zeév stated, online relationships leave room for deception; thus, people have to be cautious.

Cohabitation

Cohabitation is an arrangement where two people who are not married live together. They often involve a romantic or sexually intimate relationship on a long-term or permanent basis. Such arrangements have become increasingly common in Western countries during the past few decades, being led by changing social views, especially regarding marriage, gender roles and religion. Today, cohabitation is a common pattern among people in the Western world. In Europe, the Scandinavian countries have been the first to start this leading trend, although many countries have since followed. Mediterranean Europe has traditionally been very conservative, with religion playing a strong role. Until the mid-1990s, cohabitation levels remained low in this region, but have since increased. Cohabitation is common in many countries, with the Scandinavian nations of Iceland, Sweden, and Norway reporting

the highest percentages, and more traditional countries like India, China, and Japan reporting low percentages (DeRose, 2011).

In countries where cohabitation is increasingly common, there has been speculation as to whether or not cohabitation is now part of the natural developmental progression of romantic relationships: dating and courtship, then cohabitation, engagement, and finally marriage. Though, while many cohabitating arrangements ultimately lead to marriage, many do not.

How prevalent is cohabitation today in the United States? According to the U.S. Census Bureau (2018), cohabitation has been increasing, while marriage has been decreasing in young adulthood. As seen in the graph below, over the past 50 years, the percentage of 18-24 year olds in the U.S. living with an unmarried partner has gone from 0.1 percent to 9.4 percent, while living with a spouse has gone from 39.2 percent to 7 percent. More 18-24 year olds live with an unmarried partner now than with a married partner.

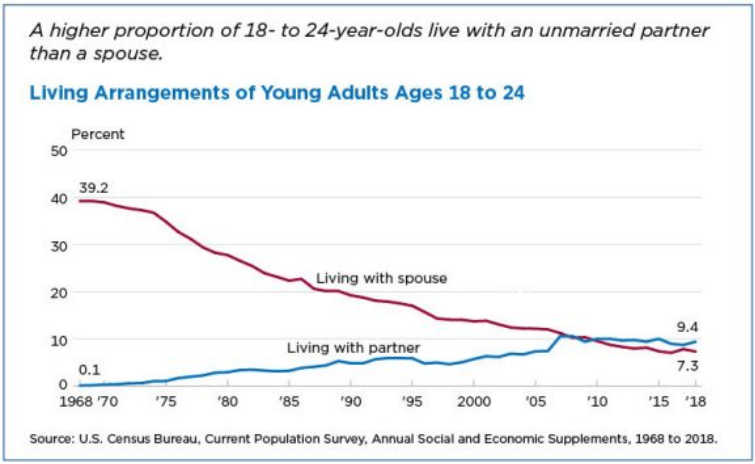

Figure 4. *The rates of those between ages 18-24 living with a spouse have gone down dramatically, while rates of those living with a partner are gradually on the rise.*

While the percent living with a spouse is still higher than the

percent living with an unmarried partner among 25 to 34-year-olds today, the next graph clearly shows a similar pattern of decline in marriage and increase in cohabitation over the last five decades. The percent living with a spouse in this age group today is only half of what it was in 1968 (40.3 percent vs. 81.5 percent), while the percent living with an unmarried partner rose from 0.2 percent to 14.8 percent in this age group. Another way to look at some of the data is that only 30% of today's 18 to 34-year-olds in the U.S. are married, compared with almost double that, 59 percent forty years ago (1978). The marriage rates for less-educated young adults (who tend to have lower income) have fallen at faster rates than those of better educated young adults since the 1970s. Past and present economic climate are key factors; perhaps more couples are waiting until they can afford to get married, financially. Gurrentz (2018) does caution that there are limitations of the measures of cohabitation, particularly in the past.

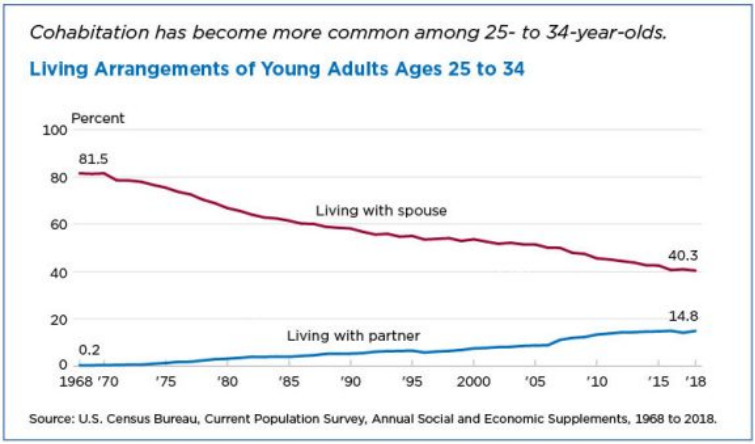

Figure 5. *Rates of those living with spouses between the ages of 25 and 34 has been declining, while those cohabitating is on the rise.*

How long do cohabiting relationships last?

Cohabitation tends to last longer in European countries than in the United States. Half of cohabiting relationships in the U. S. end within a year; only 10 percent last more than 5 years. These short-term cohabiting relationships are more characteristics of people in their early 20s. Many of these couples eventually marry. Those who cohabit more than five years tend to be older and more committed to the relationship. Cohabitation may be preferable to marriage for a number of reasons. For partners over 65, cohabitation is preferable to marriage for practical reasons. For many of them, marriage would result in a loss of Social Security benefits and consequently is not an option. Others may believe that their relationship is more satisfying because they are not bound by marriage.

Learning Outcomes

Do you think that you will cohabitate before marriage? Or did you cohabitate? Why or why not? Does your culture play a role in your decision? Does what you learned in this module change your thoughts on this practice?

Figure 6. *While marriage is common across cultures, the details such as "How" and "When" are often quite different. Now the "Who" of marriage is experiencing an important change as laws are updated in a growing number of countries and states to give same-sex couples the same rights and benefits through marriage as heterosexual couples. [Image: Bart Vis, http://goo.gl/liSy9P, CC BY 2.0, http://goo.gl/T4qgSp]*

Same-Sex Couples

As of 2019, same-sex marriage is legal in 28 countries, and counting. Many other countries either recognize same-sex couples for the purpose of immigration, grant rights for domestic partnerships or grant common law marriage status to same-sex couples.

Same-sex couples struggle with concerns such as the division of household tasks, finances, sex, and friendships as do heterosexual couples. One difference between same-sex and heterosexual couples, however, is that same-sex couples have to live with the added stress that comes from social disapproval and discrimination. And continued contact with an ex-partner may be more likely among homosexuals and bisexuals because of the closeness of the circle of friends and acquaintances.

The number of adults who remain single has increased dramatically in the last 30 years. We have more people who never marry, more widows and more divorcees driving up the number of singles. Singles represent about 25 percent of American households. Singlehood has become a more acceptable lifestyle than it was in the past and many singles are very happy with their status. Whether or not a single person is happy depends on the circumstances of their remaining single.

Stein's Typology of Singles

Many of the research findings about singles reveal that they are not all alike. Happiness with one's status depends on whether the person is single by choice and whether the situation is permanent. Let's look at Stein's (1981) four categories of singles for a better understanding of this.

- **Voluntary temporary singles**: These are younger people who have never been married and divorced people who are postponing marriage and remarriage. They may be more involved in careers or getting an education or just wanting to have fun without making a commitment to any one person. They are not quite ready for that kind of relationship. These people tend to report being very happy with their single status.
- **Voluntary permanent singles**: These individuals do not want to marry and aren't intending to marry. This might include cohabiting couples who don't want to marry, priests, nuns, or others who are not considering marriage. Again, this group is typically single by choice and understandably more contented with this decision.
- **Involuntary temporary**: These are people who are actively seeking mates. They hope to marry or remarry and may be involved in going on blind dates, seeking a partner on the internet or placing "getting personal" aids in search of a mate. They tend to be more anxious about being single.
- **Involuntary permanent**: These are older divorced, widowed, or never-married people who wanted to marry but have not found a mate and are coming to accept singlehood as a probable permanent situation. Some are bitter about not having married while others are more accepting of how their life has developed.

Engagement and Marriage

Most people will marry in their lifetime. In the majority of countries, 80% of men and women have been married by the age of 49 (United Nations, 2013). Despite how common marriage remains, it has undergone some interesting shifts in recent times. Around the world, people are tending to get married later in life or, increasingly, not at all. People in more developed countries (e.g., Nordic and Western Europe), for instance, marry later in life—at an average age of 30 years. This is very different than, for example, the economically developing country of Afghanistan, which has one of the lowest average-age statistics for marriage—at 20.2 years (United Nations, 2013). Another shift seen around the world is a gender gap in terms of age when people get married. In every country, men marry later than women. Since the 1970's, the average age of marriage has increased for both women and men.

As illustrated, the courtship process can vary greatly around the world. So too can an engagement—a formal agreement to get married. Some of these differences are small, such as on which hand an engagement ring is worn. In many countries, it is worn on the left, but in Russia, Germany, Norway, and India, women wear their ring on their right. There are also more overt differences, such as who makes the proposal. In India and Pakistan, it is not uncommon for the family of the groom to propose to the family of the bride, with little to no involvement from the bride and groom themselves. In most Western industrialized countries, it is traditional for the male to propose to the female. What types of engagement traditions, practices, and rituals are common where you are from? How are they changing?

Contemporary young adults in the United States are waiting longer than before to marry. The median age of entering marriage in the United States is 27 for women and 29 for men (U.S. Bureau of the Census, 2011). This trend in delays of young adults taking on adult roles and responsibilities is discussed in our earlier section

about "emerging adulthood" or the transition from adolescence to adulthood identified by Arnett (2000).

Social Exchange Theory

Social exchange theory suggests that people try to maximize rewards and minimize costs in social relationships. Each person entering the marriage market comes equipped with assets and liabilities or a certain amount of social currency with which to attract a prospective mate. For men, assets might include earning potential and status while for women, assets might include physical attractiveness and youth.

Customers in the "marriage market" do not look for a "good deal," however. Rather, most look for a relationship that is mutually beneficial or equitable. One of the reasons for this is because most a relationship in which one partner has far more assets than the other will result if power disparities and a difference in the level of commitment from each partner. According to Waller's principle of least interest, the partner who has the most to lose without the relationship (or is the most dependent on the relationship) will have the least amount of power and is in danger of being exploited. A greater balance of power, then, may add stability to the relationship.

Societies specify through both formal and informal rules who is an appropriate mate. Consequently, mate selection is not completely left to the individual. Rules of endogamy indicate within which groups we should marry. For example, many cultures specify that people marry within their own race, social class, age group, or religion. These rules encourage **homogamy** or marriage between people who share social characteristics (the opposite is known as **heterogamy**). The majority of marriages in the U.S. are homogamous with respect to race, social class, age and to a lesser extent, religion.

In a comparison of educational homogamy in 55 countries, Smits (2003) found strong support for higher-educated people marrying

other highly educated people. As such, education appears to be a strong filter people use to help them select a mate. The most common filters we use—or, put another way, the characteristics we focus on most in potential mates—are age, race, social status, and religion (Regan, 2008). Other filters we use include compatibility, physical attractiveness (we tend to pick people who are as attractive as we are), and proximity (for practical reasons, we often pick people close to us) (Klenke-Hamel & Janda, 1980).

According to the **filter theory of mate selection,** the pool of eligible partners becomes narrower as it passes through filters used to eliminate members of the pool (Kerckhoff & Davis, 1962). One such filter is propinquity or geographic proximity. Mate selection in the United States typically involves meeting eligible partners face to face. Those with whom one does not come into contact are simply not contenders (though this has been changing with the Internet). Race and ethnicity is another filter used to eliminate partners. Although interracial dating has increased in recent years and interracial marriage rates are higher than before, interracial marriage still represents only 5.4 percent of all marriages in the United States. Physical appearance is another feature considered when selecting a mate. Age, social class, and religion are also criteria used to narrow the field of eligibles. Thus, the field of eligibles becomes significantly smaller before those things we are most conscious of such as preferences, values, goals, and interests, are even considered.

Figure 7. *In some countries, many people are coupled and committed to marriage through arrangements made by parents or professional marriage brokers. [Image: Ananabanana, http://goo.gl/gzCR0x, CC BY-NC-SA 2.0, http://goo.gl/iF4hmM]*

Arranged Marriages

In some cultures, however, it is not uncommon for the families of young people to do the work of finding a mate for them. For example, the Shanghai Marriage Market refers to the People's Park in Shanghai, China—a place where parents of unmarried adults meet on weekends to trade information about their children in attempts to find suitable spouses for them (Bolsover, 2011). In India, the marriage market refers to the use of marriage brokers or marriage bureaus to pair eligible singles together (Trivedi, 2013). To many Westerners, the idea of arranged marriage can seem puzzling. It can appear to take the romance out of the equation and violate values about personal freedom. On the other hand, some people in favor of arranged marriage argue that parents are able to make more mature decisions than young people.

While such intrusions may seem inappropriate based on your upbringing, for many people of the world such help is expected, even appreciated. In India for example, "parental arranged marriages are largely preferred to other forms of marital choices" (Ramsheena & Gundemeda, 2015, p. 138). Of course, one's religious and social caste plays a role in determining how involved family may be.

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Parenting

Having Children

Do you want children? Do you already have children? Increasingly, families are postponing or not having children. Families that choose to forego having children are known as childfree families, while families that want but are unable to conceive are referred to as childless families. As more young people pursue their education and careers, age at first marriage has increased; similarly, so has the age at which people become parents. With a college degree, the average age for women to have their first child is 30.3, but without a college degree, the average age is 23.8. Marital status is also related,

as the average age for married women to have their first child is 28.8, while the average age for unmarried women is 23.1. Overall, the average age of first-time mothers has increased to 26, up from 21 in 1972, and the average age of first-time fathers has increased to 31, up from 27 in 1972 in the United States. The age of first-time parents in the U.S. increased sharply in the 1970s after abortion was legalized. Since the age of first-time parents varies by geographic region in the U.S. and women's rights to abortion are being challenged in some states, it will be interesting to follow the norms and trends for first-time parents in the future.

The decision to become a parent should not be taken lightly. There are positives and negatives associated with parenting that should be considered. Many parents report that having children increases their well-being (White & Dolan, 2009). Researchers have also found that parents, compared to their non-parent peers, are more positive about their lives (Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2013). On the other hand, researchers have also found that parents, compared to non-parents, are more likely to be depressed, report lower levels of marital quality, and feel like their relationship with their partner is more businesslike than intimate (Walker, 2011).

If you do become a parent, your parenting style will impact your child's future success in romantic and parenting relationships. Recall from the module on early childhood that there are several different parenting styles. **Authoritative** parenting, arguably the best parenting style, is both demanding and supportive of the child (Maccoby & Martin, 1983). Support refers to the amount of affection, acceptance, and warmth a parent provides. **Demandingness** refers to the degree a parent controls their child's behavior. Children who have authoritative parents are generally happy, capable, and successful (Maccoby, 1992).

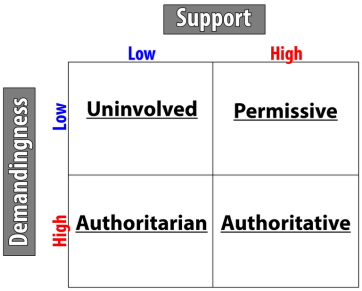

***Figure 8**. Authoritative parenting, or those parents who give high levels of support but also have high demands and expectations, are associated with the best outcomes for children,*

Other, less advantageous parenting styles include authoritarian (in contrast to authorit*ative*), permissive, and uninvolved (Tavassolie, Dudding, Madigan, Thorvardarson, & Winsler, 2016). **Authoritarian** parents are low in support and high in demandingness. Arguably, this is the parenting style used by Harry Potter's harsh aunt and uncle, and Cinderella's vindictive stepmother. Children who receive authoritarian parenting are more likely to be obedient and proficient but score lower in happiness, social competence, and self-esteem. **Permissive** parents are high in support and low in demandingness. Their children rank low in happiness and self-regulation and are more likely to have problems with authority. **Uninvolved** parents are low in both support and demandingness. Children of these parents tend to rank lowest across all life domains, lack self-control, have low self-esteem, and are less competent than their peers.

Support for the benefits of authoritative parenting has been found in countries as diverse as the Czech Republic (Dmitrieva, Chen, Greenberger, & Gil-Rivas, 2004), India (Carson, Chowdhurry, Perry, & Pati, 1999), China (Pilgrim, Luo, Urberg, & Fang, 1999), Israel (Mayseless, Scharf, & Sholt, 2003), and Palestine (Punamaki, Qouta, & Sarraj, 1997). In fact, authoritative parenting appears to be superior in Western, individualistic societies—so much so that some people have argued that there is no longer a need to study it (Steinberg, 2001). Other researchers are less certain about the superiority of authoritative parenting and point to differences in cultural values and beliefs. For example, while many European-American children do poorly with too much strictness

(authorit*arian* parenting), Chinese children often do well, especially academically. The reason for this likely stems from Chinese culture viewing strictness in parenting as related to training, which is not central to American parenting (Chao, 1994).

The Development of Parents

Think back to an emotional event you experienced as a child. How did your parents react to you? Did your parents get frustrated or criticize you, or did they act patiently and provide support and guidance? Did your parents provide lots of rules for you or let you make decisions on your own? Why do you think your parents behaved the way they did?

Psychologists have attempted to answer these questions about the influences on parents and understand why parents behave the way they do. Because parents are critical to a child's development, a great deal of research has been focused on the impact that parents have on children. Less is known, however, about the development of parents themselves and the impact of children on parents. Nonetheless, parenting is a major role in an adult's life. Parenthood is often considered a normative developmental task of adulthood. Cross-cultural studies show that adolescents around the world plan to have children. In fact, most men and women in the

***Figure 9**. Parenthood has a huge impact on a person's identity, emotions, daily behaviors, and many other aspects of their lives. [Image: Kim881231, CC0 Public Domain, https://goo.gl/m25gce]*

United States will become parents by the age of 40 years (Martinez, Daniels, & Chandra, 2012).

People have children for many reasons, including emotional reasons (e.g., the emotional bond with children and the gratification the parent–child relationship brings), economic and utilitarian reasons (e.g., children provide help in the family and support in old age), and social-normative reasons (e.g., adults are expected to have children; children provide status) (Nauck, 2007).

The Changing Face of Parenthood

Parenthood is undergoing changes in the United States and elsewhere in the world. Children are less likely to be living with both parents, and women in the United States have fewer children than they did previously. The average fertility rate of women in the United States was about seven children in the early 1900s and has remained relatively stable at 2.1 since the 1970s (Hamilton, Martin, & Ventura, 2011; Martinez, Daniels, & Chandra, 2012). Not only are parents having fewer children, but the context of parenthood has also changed. Parenting outside of marriage has increased dramatically among most socioeconomic, racial, and ethnic groups, although college-educated women are substantially more likely to be married at the birth of a child than are mothers with less education (Dye, 2010). Parenting is occurring outside of marriage for many reasons, both economic and social. People are having children at older ages, too. Despite the fact that young people are more often delaying childbearing, most 18- to 29-year-olds want to have children and say that being a good parent is one of the most important things in life (Wang & Taylor, 2011).

Table 2. Demographic Changes in Parenthood in the United States		
	1960	**2012**
Average number of children (fertility rate)	3.6	2.1
Percent of births to unmarried women	5%	41%
Median age at first marriage for women	20.8	26.5
Percent of adults ages 18 to 29 married	59%	20%

Galinsky (1987) was one of the first to emphasize the development of parents themselves, how they respond to their children's development, and how they grow as parents. Parenthood is an experience that transforms one's identity as parents take on new roles. Children's growth and development force parents to change their roles. They must develop new skills and abilities in response to children's development. Galinsky identified six stages of parenthood that focus on different tasks and goals (see Table 2).

Table 3. Galinsky's Stages of Parenthood		
	Age of Child	**Main Tasks and Goals**
Stage 1: The Image-Making Stage	Planning for a child; pregnancy	Consider what it means to be a parent and plan for changes to accommodate a child
Stage 2: The Nurturing Stage	Infancy	Develop an attachment relationship with child and adapt to the new baby
Stage 3: The Authority Stage	Toddler and preschool	Parents create rules and figure out how to effectively guide their children's behavior
Stage 4: The Interpretative Stage	Middle childhood	Parents help their children interpret their experiences with the social world beyond the family
Stage 5: The Interdependent Stage	Adolescence	Parents renegotiate their relationship with their adolescent children to allow for shared power in decision-making.
Stage 6: The Departure Stage	Early Adulthood	Parents evaluate their successes and failures as parents

1. The Image-Making Stage

As prospective parents think about and form images about their roles as parents and what parenthood will bring, and prepare for the changes an infant will bring, they enter the image-making stage. Future parents develop their ideas about what it will be like to be a parent and the type of parent they want to be. Individuals may evaluate their relationships with their own parents as a model of their roles as parents.

2. The Nurturing Stage

The second stage, the nurturing stage, occurs at the birth of the baby. A parent's main goal during this stage is to develop an attachment relationship with their baby. Parents must adapt their romantic relationships, their relationships with their other children, and with their own parents to include the new infant. Some parents feel attached to the baby immediately, but for other parents, this occurs more gradually. Parents may have imagined their infant in specific ways, but they now have to reconcile those images with their actual baby. In incorporating their relationship with their child into their other relationships, parents often have to reshape their conceptions of themselves and their identity. Parenting responsibilities are the most demanding during infancy because infants are completely dependent on caregiving.

3. The Authority Stage

The authority stage occurs when children are 2 years old until about 4 or 5 years old. In this stage, parents make decisions about how much authority to exert over their children's behavior. Parents must establish rules to guide their child's behavior and development.

They have to decide how strictly they should enforce rules and what to do when rules are broken.

4. The Interpretive Stage

The interpretive stage occurs when children enter school (preschool or kindergarten) to the beginning of adolescence. Parents interpret their children's experiences as children are increasingly exposed to the world outside the family. Parents answer their children's questions, provide explanations, and determine what behaviors and values to teach. They decide what experiences to provide their children, in terms of schooling, neighborhood, and extracurricular activities. By this time, parents have experience in the parenting role and often reflect on their strengths and weaknesses as parents, review their images of parenthood, and determine how realistic they have been. Parents have to negotiate how involved to be with their children, when to step in, and when to encourage children to make choices independently.

5. The Interdependent Stage

Parents of teenagers are in the interdependent stage. They must redefine their authority and renegotiate their relationship with their adolescent as the children increasingly make decisions independent of parental control and authority. On the other hand, parents do not permit their adolescent children to have complete autonomy over their decision-making and behavior, and thus adolescents and parents must adapt their relationship to allow for greater negotiation and discussion about rules and limits.

Figure 10. *When a child achieves a new level of independence and leaves the home it marks another turning point in the identity of a parent. [Image: State Farm, https://goo.gl/Npw2fb, CC BY 2.0, https://goo.gl/BRvSA7]*

6. The Departure Stage

During the departure stage of parenting, parents evaluate the entire experience of parenting. They prepare for their child's departure, redefine their identity as the parent of an adult child, and assess their parenting accomplishments and failures. This stage forms a transition to a new era in parents' lives. This stage usually spans a long time period from when the oldest child moves away (and often returns) until the youngest child leaves. The parenting role must be redefined as a less central role in a parent's identity.

Despite the interest in the development of parents among laypeople and helping professionals, little research has examined developmental changes in parents' experience and behaviors over time. Thus, it is not clear whether these theoretical stages are generalizable to parents of different races, ages, and religions, nor do we have empirical data on the factors that influence individual differences in these stages. On a practical note, how-to books and websites geared toward parental development should be evaluated with caution, as not all advice provided is supported by research.

Influences on Parenting

Parenting is a complex process in which parents and children influence one another. There are many reasons that parents behave the way they do. The multiple influences on parenting are still being explored. Proposed influences on parental behavior include 1)

parent characteristics, 2) child characteristics, and 3) contextual and sociocultural characteristics (Belsky, 1984; Demick, 1999).

Parent Characteristics

Parents bring unique traits and qualities to the parenting relationship that affect their decisions as parents. These characteristics include the age of the parent, gender, beliefs, personality, developmental history, knowledge about parenting and child development, and mental and physical health. Parents' personalities affect parenting behaviors. Mothers and fathers who are more agreeable, conscientious, and outgoing are warmer and provide more structure to their children. Parents who are more agreeable, less anxious, and less negative also support their children's autonomy more than parents who are anxious and less agreeable (Prinzie, Stams, Dekovic, Reijntjes, & Belsky, 2009). Parents who have these personality traits appear to be better able to respond to their children positively and provide a more consistent, structured environment for their children.

Parents' developmental histories, or their experiences as children, also affect their parenting strategies. Parents may learn parenting practices from their own parents. Fathers whose own parents provided monitoring, consistent and age-appropriate discipline, and warmth were more likely to provide this constructive parenting to their own children (Kerr, Capaldi, Pears, & Owen, 2009). Patterns of negative parenting and ineffective discipline also appear from one generation to the next. However, parents who are dissatisfied with their own parents' approach may be more likely to change their parenting methods with their own children.

Child Characteristics

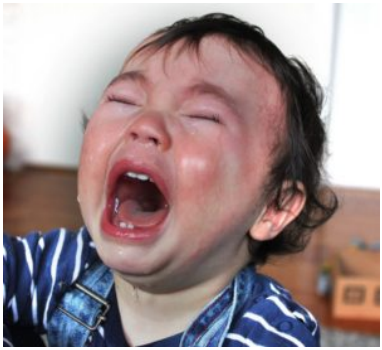

Figure 11. *A child with a difficult temperament can have a significant impact on a parent. [Image: Harald Groven, https://goo.gl/cwemLg, CC BY-SA 2.0, https://goo.gl/eH69he]*

Parenting is bidirectional. Not only do parents affect their children, but children also influence their parents. Child characteristics, such as gender, birth order, temperament, and health status, affect parenting behaviors and roles. For example, an infant with an easy temperament may enable parents to feel more effective, as they are easily able to soothe the child and elicit smiling and cooing. On the other hand, a cranky or fussy infant elicits fewer positive reactions from his or her parents and may result in parents feeling less effective in the parenting role (Eisenberg et al., 2008). Over time, parents of more difficult children may become more punitive and less patient with their children (Clark, Kochanska, & Ready, 2000; Eisenberg et al., 1999; Kiff, Lengua, & Zalewski, 2011). Parents who have a fussy, difficult child are less satisfied with their marriages and have greater challenges in balancing work and family roles (Hyde, Else-Quest, & Goldsmith, 2004). Thus, child temperament is one of the child characteristics that influence how parents behave with their children.

Another child characteristic is the gender of the child. Parents respond differently to boys and girls. Parents often assign different household chores to their sons and daughters. Girls are more often responsible for caring for younger siblings and household chores, whereas boys are more likely to be asked to perform chores outside the home, such as mowing the lawn (Grusec, Goodnow, & Cohen, 1996). Parents also talk differently with their sons and daughters,

providing more scientific explanations to their sons and using more emotional words with their daughters (Crowley, Callanan, Tenenbaum, & Allen, 2001).

Contextual Factors and Sociocultural Characteristics

The parent–child relationship does not occur in isolation. Sociocultural characteristics, including economic hardship, religion, politics, neighborhoods, schools, and social support, also influence parenting. Parents who experience economic hardship are more easily frustrated, depressed, and sad, and these emotional characteristics affect their parenting skills (Conger & Conger, 2002). Culture also influences parenting behaviors in fundamental ways. Although promoting the development of skills necessary to function effectively in one's community is a universal goal of parenting, the specific skills necessary vary widely from culture to culture. Thus, parents have different goals for their children that partially depend on their culture (Tamis-LeMonda et al., 2008). For example, parents vary in how much they emphasize goals for independence and individual achievements, and goals involving maintaining harmonious relationships and being embedded in a strong network of social relationships. These differences in parental goals are influenced by culture and by immigration status. Other important contextual characteristics, such as the neighborhood, school, and social networks, also affect parenting, even though these settings don't always include both the child and the parent (Brofenbrenner, 1989). For example, Latina mothers who perceived their neighborhood as more dangerous showed less warmth with their children, perhaps because of the greater stress associated with living a threatening environment (Gonzales et al., 2011). Many contextual factors influence parenting.

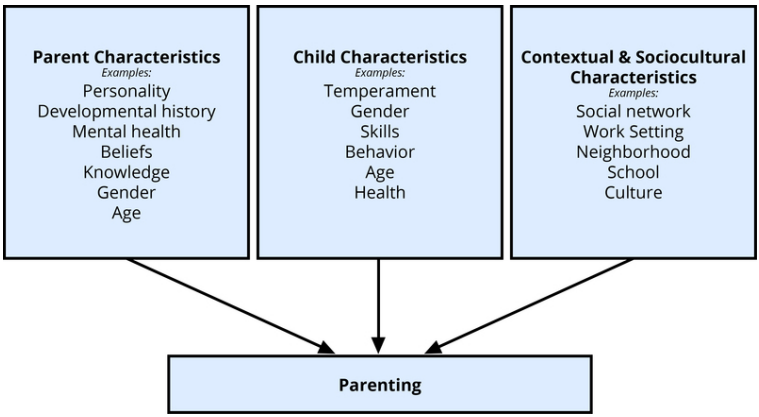

Figure 12. *Influences on parenting include characteristics of the parent and child, as well as the context and world around them.*

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Emotional and Social Development in Middle Adulthood

Traditionally, middle adulthood has been regarded as a period of reflection and change. In the popular imagination (and academic press) there has been a reference to a "mid-life crisis." There is an emerging view that this may have been an overstatement—certainly, the evidence on which it is based has been seriously questioned. However, there is some support for the view that people do undertake a sort of emotional audit, reevaluate their priorities, and emerge with a slightly different orientation to emotional regulation and personal interaction in this time period. Why, and the mechanisms through which this change is affected, are a matter of some debate. We will examine the ideas of Erikson, Baltes, and Carstensen, and how they might inform a more nuanced understanding of this vital part of the lifespan.

Psychosocial Development in Midlife

What do you think is the happiest stage of life? What about the saddest stages? Perhaps surprisingly, Blanchflower & Oswald (2008) found that reported levels of unhappiness and depressive symptoms peak in the early 50s for men in the U.S., and interestingly, the late

30s for women. In Western Europe, minimum happiness is reported around the mid-40s for both men and women, albeit with some significant national differences. Stone, Schneider, and Bradoch (2017), reported a precipitous drop in perceived stress in men in the U.S. from their early 50s. There is now a view that "older people" (50+) may be "happier" than younger people, despite some cognitive and functional losses. This is often referred to as "the paradox of aging." Positive attitudes to the continuance of cognitive and behavioral activities, interpersonal engagement, and their vitalizing effect on human neural plasticity, may lead not only to more life, but to an extended period of both self-satisfaction and continued communal engagement.

Erikson's Theory

As you know by now, Erikson's theory is based on an idea called epigenesis, meaning that development is progressive and that each individual must pass through the eight different stages of life—all while being influenced by context and environment. Each stage forms the basis for the following stage, and each transition to the next is marked by a crisis that must be resolved. The sense of self, each "season", was wrested, from and by, that conflict. The ages 40-65 are no different. The individual is still driven to engage productively, but the nurturing of children and income generation assume lesser functional importance. From where will the individual derive their sense of self and self-worth?

Generativity versus Stagnation is Erikson's characterization of the fundamental conflict of adulthood. It is the seventh conflict of his famous "8 seasons of man" (1950) and negotiating this conflict results in the virtue of care. **Generativity** is "primarily the concern in establishing and guiding the next generation" (Erikson, 1950 p.267). Generativity is a concern for a generalized other (as well as those close to an individual) and occurs when a person can

shift their energy to care for and mentor the next generation. One obvious motive for this generative thinking might be parenthood, but others have suggested intimations of mortality by the self. John Kotre (1984) theorized that generativity is a selfish act, stating that its fundamental task was to outlive the self. He viewed generativity as a form of investment. However, a commitment to a "belief in the species" can be taken in numerous directions, and it is probably correct to say that most modern treatments of generativity treat it as a collection of facets or aspects—encompassing creativity, productivity, commitment, interpersonal care, and so on.

On the other side of generativity is **stagnation**. It is the feeling of lethargy and a lack of enthusiasm and involvement in both individual and communal affairs. It may also denote an underdeveloped sense of self, or some form of overblown narcissism. Erikson sometimes used the word "rejectivity" when referring to severe stagnation

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The Stage-Crisis View and the Midlife Crisis

In 1977, Daniel Levinson published an extremely influential article that would be seminal in establishing the idea of a profound crisis that lies at the heart of middle adulthood. The concept of a midlife crisis is so pervasive that over 90% of Americans are familiar with the term, although those who actually report experiencing such a crisis is significantly lower (Wethington, 2000).

Levinson based his findings about a midlife crisis on biographical interviews with a limited sample of 40 men (no women!), and an entirely American sample at that. Despite these severe methodological limitations, his findings proved immensely influential. Levinson (1986) identified five main stages or "seasons" of a man's life as follows:

1. Preadulthood: Ages 0-22 (with 17 – 22 being the Early Adult Transition years)
2. Early Adulthood: Ages 17-45 (with 40 – 45 being the Midlife Transition years)
3. Middle Adulthood: Ages 40-65 (with 60-65 being the Late Adult Transition years)
4. Late Adulthood: Ages 60-85
5. Late Late Adulthood: Ages 85+

***Figure 1**. According to Levinson, we go through a midlife crisis. While most people have heard of the midlife crisis, and often associate with sports cars, joining a band, or exploring new relationships, there is very little support for the theory as it was proposed by Levinson.*

Levinson's theory is known as the stage-crisis view. He argued that each stage overlaps, consisting of two distinct phases—a stable phase, and a transitional phase into the following period. The latter phase can involve questioning and change, and Levinson believed that 40-45 was a period of profound change, which could only culminate in a reappraisal, or perhaps reaffirmation, of goals, commitments and previous choices—a time for taking stock and recalibrating what was important in life. Crucially, Levinson would argue that a much wider range of factors, involving, primarily, work and family, would affect this taking stock – what he had achieved, what he had not; what he thought important, but had brought only limited satisfaction.

In 1996, two years after his death, the study he was conducting with his co-author and wife Judy Levinson, was published on "the seasons of life" as experienced by women. Again, it was a small scale study, with 45 women who were professionals / businesswomen, academics, and homemakers, in equal proportion. The changing place of women in society was reckoned by Levinson to be a profound moment in the social evolution of the human species, however, it had led to a fundamental polarity in the way that women formed and understood their social identity. Levinson referred to this as the "dream." For men, the "dream" was formed in the age period of 22-28, and largely centered on the occupational role and professional ambitions. Levinson understood the female "dream" as fundamentally split between this work-centered orientation, and the desire/imperative of marriage/family; a polarity that heralded both new opportunities, and fundamental angst.

Levinson found that the men and women he interviewed sometimes had difficulty reconciling the "dream" they held about the future with the reality they currently experienced. "What do I really get from and give to my wife, children, friends, work, community and self?" a man might ask (Levinson, 1978, p. 192). Tasks of the midlife transition include:

1. ending early adulthood;
2. reassessing life in the present and making modifications if needed; and
3. reconciling "polarities" or contradictions in one's sense of self.

Perhaps early adulthood ends when a person no longer seeks adult status but feels like a full adult in the eyes of others. This "permission" may lead to different choices in life—choices that are made for self-fulfillment instead of social acceptance. While people in their 20s may emphasize how old they are (to gain respect, to be viewed as experienced), by the time people reach their 40s, they tend to emphasize how young they are (few 40-year-olds cut each other down for being so young: "You're only 43? I'm 48!!").

This new perspective on time brings about a new sense of urgency to life. The person becomes focused more on the present than the future or the past. The person grows impatient at being in the "waiting room of life," postponing doing the things they have always wanted to do. "If it's ever going to happen, it better happen now." A previous focus on the future gives way to an emphasis on the present. Neugarten (1968) notes that in midlife, people no longer think of their lives in terms of how long they have lived. Rather, life is thought of in terms of how many years are left. If an adult is not satisfied at midlife, there is a new sense of urgency to start to make changes now.

Changes may involve ending a relationship or modifying one's expectations of a partner. These modifications are easier than changing the self (Levinson, 1978). Midlife is a period of transition in which one holds earlier images of the self while forming new

ideas about the self of the future. Greater awareness of aging accompanies feelings of youth, and harm that may have been done previously in relationships haunts new dreams of contributing to the well-being of others. These polarities are the quieter struggles that continue after outward signs of "crisis" have gone away.

Levinson characterized midlife as a time of developmental crisis. However, like any body of work, it has been subject to criticism. Firstly, the sample size of the populations on which he based his primary findings is too small. By what right do we generalize findings from interviews with 40 men, and 45 women, however thoughtful and well-conducted? Secondly, Chiriboga (1989) could not find any substantial evidence of a midlife crisis, and it might be argued that this, and further failed attempts at replication, indicate a cohort effect. The findings from Levinson's population indicated a shared historical and cultural situatedness, rather than a cross-cultural universal experienced by all or even most individuals. Midlife is a time of revaluation and change, that may escape precise determination in both time and geographical space, but people do emerge from it, and seem to enjoy a period of contentment, reconciliation, and acceptance of self.

Watch It

This video explains research and controversy surrounding the concept of a midlife crisis.

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Socio-Emotional Selectivity Theory (SST)

It is the inescapable fate of human beings to know that their lives are limited. As people move through life, goals, and values tend to

shift. What we consider priorities, goals, and aspirations are subject to renegotiation. Attachments to others, current, and future, are no different. Time is not the unlimited good as perceived by a child under normal social circumstances; it is very much a valuable commodity, requiring careful consideration in terms of the investment of resources. This has become known in the academic literature as mortality salience.

Mortality salience posits that reminders about death or finitude (at either a conscious or subconscious level), fill us with dread. We seek to deny its reality, but awareness of the increasing nearness of death can have a potent effect on human judgment and behavior. This has become a very important concept in contemporary social science. It is with this understanding that Laura Carstensen developed the theory of **socioemotional selectivity theory**, or SST. The theory maintains that as time horizons shrink, as they typically do with age, people become increasingly selective, investing greater resources in emotionally meaningful goals and activities. According to the theory, motivational shifts also influence cognitive processing. Aging is associated with a relative preference for positive over negative information. This selective narrowing of social interaction maximizes positive emotional experiences and minimizes emotional risks as individuals become older. They systematically hone their social networks so that available social partners satisfy their emotional needs. The French philosopher Sartre observed that "hell is other people". An adaptive way of maintaining a positive affect might be to reduce contact with those we know may negatively affect us, and avoid those who might.

SST is a theory that emphasizes a time perspective rather than chronological age. When people perceive their future as open-ended, they tend to focus on future-oriented development or knowledge-related goals. When they feel that time is running out, and the opportunity to reap rewards from future-oriented goals' realization is dwindling, their focus tends to shift towards present-oriented and emotion or pleasure-related goals. Research on this theory often compares age groups (*e.g.*, young adulthood vs. old

adulthood), but the shift in goal priorities is a gradual process that begins in early adulthood. Importantly, the theory contends that the cause of these goal shifts is not age itself, *i.e.*, not the passage of time itself, but rather an age-associated shift in time perspective. The theory also focuses on the types of goals that individuals are motivated to achieve. Knowledge-related goals aim at knowledge acquisition, career planning, the development of new social relationships and other endeavors that will pay off in the future. Emotion-related goals are aimed at emotion regulation, the pursuit of emotionally gratifying interactions with social partners, and other pursuits whose benefits can be realized in the present.

This shift in emphasis, from long-term goals to short-term emotional satisfaction, may help explain the previously noted "paradox of aging." That is, that despite noticeable physiological declines, and some notable self-reports of reduced life satisfaction around this time, post- 50 there seems to be a significant increase in reported subjective well-being. SST does not champion social isolation, which is harmful to human health, but shows that increased selectivity in human relationships, rather than abstinence, leads to more positive affect. Perhaps "midlife crisis and recovery" may be a more apt description of the 40-65 period of the lifespan.

Watch It

Watch Laura Carstensen in this TED talk explain how happiness actually increases with age.

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Selection, Optimization, Compensation (SOC)

Figure 2. *Italian soccer player Paulo Maldini in 2008, just one year before he retired at age 41. He appeared in an incredible 8 champions league finals during his 25-year career. Defensive players like Maldini tend to have a longer career due to their experience compensating for a decline in pace, while offensive players are generally sought after for their agility and speed.*

Another perspective on aging was identified by German developmental psychologists Paul and Margret Baltes. Their text *Successful Aging* (1990) marked a seismic shift in moving social science research on aging from largely a deficits-based perspective to a newer understanding based on a holistic view of the life-course itself. The former had tended to focus exclusively on what was lost during the aging process, rather than seeing it as a balance between those losses and gains in areas like the regulation of emotion, experience, and wisdom.

The Baltes' model for successful aging argues that across the lifespan, people face various opportunities or challenges such as, jobs, educational opportunities, and illnesses. According to the SOC model, a person may select particular goals or experiences, or circumstances might impose themselves on them. Either way, the selection process includes

shifting or modifying goals based on choice or circumstance in response to those circumstances. The change in direction may occur at the subconscious level. This model emphasizes that setting goals and directing efforts towards a specific purpose is beneficial to healthy aging. Optimization is about making the best use of the resources we have in pursuing goals. Compensation, as its name suggests, is about using alternative strategies in attaining those goals.

The processes of selection, optimization, and compensation can be found throughout the lifespan. As we progress in years, we select areas in which we place resources, hoping that this selection will optimize the resources that we have, and compensate for any defects accruing from physiological or cognitive changes. Previous accounts of aging had understated the degree to which possibilities from which we choose had been eliminated, rather than reduced, or even just changed. As we select areas in which to invest, there is always an opportunity cost. We are masters of our own destiny, and our own individual orientation to the SOC processes will dictate "successful aging." Rather than seeing aging as a process of progressive disengagement from social and communal roles undertaken by a group, Baltes argued that "successful aging" was a matter of sustained individual engagement, accompanied by a belief in individual self-efficacy and mastery.

The SOC model covers a number of functional domains—motivation, emotion, and cognition. We might become more adept at playing the SOC game as time moves on, as we work to compensate and adjust for changing abilities across the lifespan. For example, a soccer player at 35 may no longer have the vascular and muscular fitness that they had at 20 but her "reading" of the game might compensate for this decline. She may well be a better player than she was at 20, even with fewer physical resources in a game which ostensibly prioritizes them. The work of Paul and Margaret Baltes was very influential in the formation of a very broad developmental perspective that would coalesce around the central idea of resiliency.

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Personality and Work Satisfaction

Personality in Midlife

Research on adult personality examines normative age-related increases and decreases in the expression of the so-called "Big Five" traits—extroversion, neuroticism, conscientiousness, agreeableness, and openness to experience. These are assumed to be based largely on biological heredity. These five traits are sometimes summarized via the OCEAN acronym. Individuals are assessed by the measurement of these traits along a continuum (e.g. high extroversion to low extroversion). They now dominate the field of empirical personality research. Does personality change

throughout adulthood? Previously the answer was thought to be no. It was William James who stated in his foundational text, *The Principles of Psychology* (1890), that "[i]n most of us, by the age of thirty, the character is set like plaster, and will never soften again". Not surprisingly, this became known as the **plaster hypothesis.**

Contemporary research shows that, although some people's personalities are relatively stable over time, others are not (Lucas & Donnellan, 2011; Roberts & Mroczek, 2008). Longitudinal studies reveal average changes during adulthood, and individual differences in these patterns over the lifespan may be due to idiosyncratic life events (e.g., divorce, illness). Roberts, Wood & Caspi (2008) report evidence of increases in agreeableness and conscientiousness as persons age, mixed results in regard to openness, reduction in neuroticism but only in women, and no change with regard to extroversion. Whether this "maturation" is the cause or effect of some of the changes noted in the section devoted to psychosocial development is still unresolved. Longitudinal research also suggests that adult personality traits, such as conscientiousness, predict important life outcomes including job success, health, and longevity (Friedman, Tucker, Tomlinson-Keasey, Schwartz, Wingard, & Criqui, 1993; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). How important these changes remain somewhat unresolved. Thus, we have the hard plaster hypothesis, emphasizing fixity in personality over the age of thirty with some very minor variation, and the soft plaster version which views these changes as possible and important.

Carl Jung believed that our personality actually matures as we get older. A healthy personality is one that is balanced. People suffer tension and anxiety when they fail to express all of their inherent qualities. Jung believed that each of us possesses a "shadow side." For example, those who are typically introverted also have an extroverted side that rarely finds expression unless we are relaxed and uninhibited. Each of us has both a masculine and feminine side, but in younger years, we feel societal pressure to give expression only to one. As we get older, we may become freer to express all of our traits as the situation arises. We find gender convergence in older adults. Men become more interested in intimacy and family ties. Women may become more assertive. This gender convergence is also affected by changes in society's expectations for males and females. With each new generation, we find that the roles of men and women are less stereotypical, and this allows for change as well.

Figure 3. *Personalities in midlife are not as set as researchers once thought, and may still mature as we get older.*

Subjective Aging

One aspect of the self that particularly interests life span and life course psychologists is the individual's perception and evaluation of their own aging and identification with an age group. Subjective age is a multidimensional construct that indicates how old (or young) a person feels, and into which age group a person categorizes themself. After early adulthood, most people say that they feel younger than their chronological age, and the gap between subjective age and actual age generally increases. On average, after age 40 people report feeling 20% younger than their actual age

(e.g., Rubin & Berntsen, 2006). Asking people how satisfied they are with their own aging assesses an evaluative component of age identity. Whereas some aspects of age identity are positively valued (e.g., acquiring seniority in a profession or becoming a grandparent), others may be less valued, depending on societal context. Perceived physical age (i.e., the age one looks in a mirror) is one aspect that requires considerable self-related adaptation in social and cultural contexts that value young bodies. Feeling younger and being satisfied with one's own aging are expressions of positive self-perceptions of aging. They reflect the operation of self-related processes that enhance well-being. Levy (2009) found that older individuals who are able to adapt to and accept changes in their appearance and physical capacity in a positive way report higher well-being, have better health, and live longer.

There is now an increasing acceptance of the view within developmental psychology that an uncritical reliance on chronological age may be inappropriate. People have certain expectations about getting older, their own idiosyncratic views, and internalized societal beliefs. Taken together they constitute a tacit knowledge of the aging process. A negative perception of how we are aging can have real results in terms of life expectancy and poor health. Levy et al (2002) estimated that those with positive feelings about aging lived 7.5 years longer than those who did not. Subjective aging encompasses a wide range of psychological perspectives and empirical research. However, there is now a growing body of work centered around a construct referred to as Awareness of Age-Related Change (AARC) (Diehl et al, 2015), which examines the effects of our subjective perceptions of age and their consequential, and very real, effects. Neuport & Bellingtier (2017) report that this subjective awareness can change on a daily basis, and that negative events or comments can disproportionately affect those with the most positive outlook on aging.

Work Satisfaction

Middle adulthood is characterized by a time of transition, change, and renewal. Accordingly, attitudes about work and satisfaction from work tend to undergo a transformation or reorientation during this time. Age is positively related to job satisfaction—the older we get the more we derive satisfaction from work(Ng & Feldman, 2010). However, that is far from the entire story and repeats, once more, the paradoxical nature of the research findings from this period of the life course. Dobrow, Gazach & Liu (2018) found that job satisfaction in those aged 43-51 was correlated with advancing age, but that there was increased dissatisfaction the longer one stayed in the same job. Again, as socio-emotional selectivity theory would predict, there is a marked reluctance to tolerate a work situation deemed unsuitable or unsatisfying. Years left, as opposed to years spent, necessitates a sense of purpose in all daily activities and interactions, including work.

The workplace today is one in which many people from various walks of life come together. Work schedules are more flexible and varied, and more work independently from home or anywhere there is an internet connection. The midlife worker must be flexible, stay current with technology, and be capable of working within a global community.

Watch It

Seeking job enjoyment may account for the fact that many people over 50 sometimes seek changes in employment known as "encore careers." Some midlife adults anticipate retirement, while others may be

postponing it for financial reasons, or others may simple feel a desire to continue working.

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Relationships at Work

***Figure 4**. Healthy work relationships have a big impact on job satisfaction.*

Working adults spend a large part of their waking hours in relationships with coworkers and supervisors. Because these relationships are forced upon us by work, researchers focus less on their presence or absence and instead focus on their quality. High-quality work relationships can make jobs enjoyable and less stressful. This is because workers experience mutual trust and support in the workplace to overcome work challenges. Liking the people we work with can also translate to more humor and fun on the job. Research has shown that supervisors who are more supportive have employees who are more likely to thrive at work (Paterson, Luthans, & Jeung, 2014; Monnot & Beehr, 2014; Winkler, Busch, Clasen, & Vowinkel, 2015). On the other hand, poor quality work relationships can make a job feel like drudgery. Everyone knows that horrible bosses can make the workday unpleasant.

Supervisors that are sources of stress have a negative impact on the subjective well-being of their employees (Monnot & Beehr, 2014). Specifically, research has shown that employees who rate their supervisors high on the so-called "dark triad"—psychopathy, narcissism, and Machiavellianism—reported greater psychological distress at work, as well as less job satisfaction (Mathieu, Neumann, Hare, & Babiak, 2014).

In addition to the direct benefits or costs of work relationships on our well-being, we should also consider how these relationships can impact our job performance. Research has shown that feeling engaged in our work and having a high job performance predicts better health and greater life satisfaction (Shimazu, Schaufeli, Kamiyama, & Kawakami, 2015). Given that so many of our waking hours are spent on the job—about 90,000 hours across a lifetime—it makes sense that we should seek out and invest in positive relationships at work.

One of the most influential researchers in this field, Dorien Kooij (2013) identified four key motivations in older adults continuing to work. First, growth or development motivation- looking for new challenges in the work environment. The second are feelings of recognition and power. Third, feelings of power and security afforded by income and possible health benefits. Interestingly enough, the fourth area of motivation was Erikson's generativity. The latter has been criticized for a lack of support in terms of empirical research findings, but two studies (Zacher et al, 2012; Ghislieri & Gatti, 2012) found that a primary motivation in continuing to work was the desire to pass on skills and experience, a process they describe as **leader generativity**. Perhaps a more straightforward term might be mentoring. In any case, the concept of generative leadership is now firmly established in the business and organizational management literature.

Organizations, public and private, are going to have to deal with an older workforce. The proportion of people in Europe over 60 will increase from 24% to 34% by 2050 (United Nations 2015), the US Bureau of Labor Statistics predicts that 1 in 4 of the US workforce

will be 55 or over. Workers may have good reason to avoid retirement, although it is often viewed as a time of relaxation and well-earned rest, statistics may indicate that a continued focus on the future may be preferable to stasis, or inactivity. In fact, Fitzpatrick & Moore (2018) report that death rates for American males jump 2% immediately after they turn 62, most likely a result of changes induced by retirement. Interestingly, this small spike in death rates is not seen in women, which may be the result of women having stronger social determinants of health (SDOH), which keep them active and interacting with others out of retirement.

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Relationships in Middle Adulthood

The importance of establishing and maintaining relationships in middle adulthood is now well established in the academic literature—there are now thousands of published articles purporting to demonstrate that social relationships are integral to any and all aspects of subjective well-being and physiological functioning, and these help to inform actual healthcare practices. Studies show an increased risk of dementia, cognitive decline, susceptibility to vascular disease, and increased mortality in those who feel isolated and alone. However, loneliness is not confined to people living a solitary existence. It can also refer to those who endure a perceived discrepancy in the socio-emotional benefits of interactions with others, either in number or nature. One may have an expansive social network and still feel a dearth of emotional satisfaction in one's own life.

Socioemotional selectivity theory (SST) predicts a quantitative decrease in the number of social interactions in favor of those bringing greater emotional fulfillment. Over the past thirty years,

or more, there have been significant social changes which have, in turn, had a large effect on human bonding. These have affected the way we manage our emotional interactions, and the manner in which society views, shapes and supports that emotional regulation. Government policy has also changed, and had a profound influence, on how families are shaped, reshaped, and operate as social and economic agents.

Relationships and Family Life in Middle Adulthood

Intimate Relationships

It makes sense to consider the various types of relationships in our lives when trying to determine just how relationships impact our well-being. For example, would you expect a person to derive the same happiness from an ex-spouse as from a child or coworker? Among the most important relationships for most people is their long-time romantic partner. Most researchers begin their investigation of this topic by focusing on intimate relationships because they are the closest form of social bond. Intimacy is more than just physical in nature; it also entails psychological closeness. Research findings suggest that having a single confidante—a person with whom you can be authentic and trust not to exploit your secrets and vulnerabilities—is more important to happiness than having a large social network (Taylor, 2010).

Another important aspect of relationships is the distinction between formal and informal. Formal relationships are those that are bound by the rules of politeness. In most cultures, for instance, young people treat older people with formal respect, avoiding profanity and slang when interacting with them. Similarly, workplace relationships tend to be more formal, as do relationships

with new acquaintances. Formal connections are generally less relaxed because they require a bit more work, demanding that we exert more self-control. Contrast these connections with informal relationships—friends, lovers, siblings, or others with whom you can relax. We can express our true feelings and opinions in these informal relationships, using the language that comes most naturally to us, and generally be more authentic. Because of this, it makes sense that more intimate relationships—those that are more comfortable and in which you can be more vulnerable—might be the most likely to translate to happiness.

Marriage and Happiness

Figure 1*. Relationships that allow us to be our authentic self bring the most happiness.*

One of the most common ways that researchers often begin to investigate intimacy is by looking at marital status. The well-being of married people is compared to that of people who are single or have never been married. In other research, married people are compared to people who are divorced or widowed (Lucas & Dyrenforth, 2005). Researchers have found that the transition from singlehood to marriage brings about an increase in subjective well-being (Haring-Hidore, Stock, Okun, & Witter, 1985; Lucas, 2005; Williams, 2003). In fact, this finding is one of the strongest in social science research on personal relationships over the past quarter of a century.

As is usually the case, the situation is more complex than might initially appear. As a marriage progresses, there is some evidence for regression to a **hedonic set-point—**that is, most individuals have a set happiness point or level, and that both good and bad life

events – marriage, bereavement, unemployment, births, and so on – have some effect for a period of time, but over many months, they will return to that set-point. One of the best studies in this area is that of Luhmann et al (2012), who report a gradual decline in subjective well-being after a few years, especially in the component of affective well-being. Adverse events obviously have an effect on subjective well-being and happiness, and these effects can be stronger than the positive effects of being married in some cases (Lucas, 2005).

Although research frequently points to marriage being associated with higher rates of happiness, this does not guarantee that getting married will make you happy! The quality of one's marriage matters greatly. When a person remains in a problematic marriage, it takes an emotional toll. Indeed, a large body of research shows that people's overall life satisfaction is affected by their satisfaction with their marriage (Carr, Freedman, Cornman, Schwarz, 2014; Dush, Taylor, & Kroeger, 2008; Karney, 2001; Luhmann, Hofmann, Eid, & Lucas, 2012; Proulx, Helms, & Buehler, 2007). The lower a person's self-reported level of marital quality, the more likely he or she is to report depression (Bookwala, 2012). In fact, longitudinal studies—those that follow the same people over a period of time—show that as marital quality declines, depressive symptoms increase (Fincham, Beach, Harold, & Osborne, 1997; Karney, 2001). Proulx and colleagues (2007) arrived at this same conclusion after a systematic review of 66 cross-sectional and 27 longitudinal studies.

Marital satisfaction has peaks and valleys during the course of the life cycle. Rates of happiness are highest in the years prior to the birth of the first child. It hits a low point with the coming of children. Relationships typically become more traditional and there are more financial hardships and stress in living. Children bring new expectations to the marital relationship. Two people who are comfortable with their roles as partners may find the added parental duties and expectations more challenging to meet. Some couples elect not to have children in order to have more time and resources for the marriage. These child-free couples are

happy keeping their time and attention on their partners, careers, and interests.

What is it about bad marriages, or bad relationships in general, that takes such a toll on well-being? Research has pointed to conflict between partners as a major factor leading to lower subjective well-being (Gere & Schimmack, 2011). This makes sense. Negative relationships are linked to ineffective social support (Reblin, Uchino, & Smith, 2010) and are a source of stress (Holt-Lunstad, Uchino, Smith, & Hicks, 2007). In more extreme cases, physical and psychological abuse can be detrimental to well-being (Follingstad, Rutledge, Berg, Hause, & Polek, 1990). Victims of abuse sometimes feel shame, lose their sense of self, and become less happy and prone to depression and anxiety (Arias & Pape, 1999). However, the unhappiness and dissatisfaction that occur in abusive relationships tend to dissipate once the relationships end. (Arriaga, Capezza, Goodfriend, Rayl & Sands, 2013).

Typology of Marriage

One way marriages vary is with regard to the reason the partners are married. Some marriages have intrinsic value: the partners are together because they enjoy, love and value one another. Marriage is not thought of as a means to another end, instead, it is regarded as an end in itself. These partners look for someone they are drawn to, and with whom they feel a close and intense relationship. Other marriages called utilitarian marriages are unions entered into primarily for practical reasons. For example, marriage brings financial security, children, social approval, housekeeping, political favor, a good car, a great house, and so on.

There have been a few attempts to establish a typological framework for marriages. The best-known is that of Olson (1993), who referred to five typical kinds of marriage. Using a sample of 6,267 couples, Olson & Fowers (1993) identified eleven relationship domains that covered both areas related to relationship satisfaction, and the more functional areas related to marriage. So, five of the eleven included areas such as marital satisfaction, communication, and, things like financial management, parenting, and egalitarian roles. Using these eleven areas they came up with five kinds of marriage. One aspect of this early study is **the link between marital satisfaction and income/college education**. The link between these factors is now commonplace in the literature. Olson & Fowers (1993) were one of the first studies to point to this link. The less well-off are more prone to divorce, as are those with less college-level education. Income and college education are of course linked, and there is now increasing concern that marital dissolution and broader patterns of social inequality are now inextricably linked.

- vitalized: Very high relationship quality. Tend to belong in a higher income bracket. Happy with their spouse across all areas: personality, communication, roles and expectations.
- harmonious relationships: These marriages have some areas of tension and disagreement but there is still broad agreement on major issues. Lack of agreement on parenting was the primary feature of this group, although the couples still scored highly on relationship quality.
- traditional marriages: Much less emphasis on emotional closeness, but still slightly above average.

High levels of compatibility in relation to parenting.

- conflicted: These marriages accomplish functional goals such as parenting but are marked by a great deal of interpersonal disagreement. Communication and conflict resolution scores are extremely low.
- devitalized: low scores across all eleven areas – Little interpersonal closeness and little agreement on family roles.

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The Family Life Cycle

To better understand patterns of family life and changes in roles and expectations as a family ages, researchers have theorized about typical stages of family life. Read more about the family life cycle in the following interactive activity.

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Marital Communication

Advice on how to improve one's marriage is centuries old. One of today's experts on marital communication is John Gottman. Gottman differs from many marriage counselors in his belief that having a good marriage does not depend on compatibility, rather, the way that partners communicate with one another is crucial. At the University of Washington in Seattle, Gottman has measured the physiological responses of thousands of couples as they discuss issues that have led to disagreements. Fidgeting in one's chair, leaning closer to or further away from the partner while speaking, and increases in respiration and heart rate are all recorded and analyzed, along with videotaped recordings of the partners' exchanges.

Gottman believes he can accurately predict whether or not a couple will stay together by analyzing their communication. In marriages destined to fail, partners engage in the "marriage killers" such as contempt, criticism, defensiveness, and stonewalling. Each of these undermines the politeness and respect that healthy

marriages require. According to Gottman, stonewalling, or shutting someone out, is the strongest sign that a relationship is destined to fail. Perhaps the most interesting aspect of Gottman's work is the emphasis on the fact that marriage is about constant negotiation rather than conflict resolution.

What Gottman terms perpetual problems, are responsible for 69% of conflicts within marriage. For example, if someone in a couple has said, "I am so sick of arguing over this," then that may be a sign of a perpetual problem. While this may seem problematic, Gottman argues that couples can still be connected despite these perpetual problems if they can laugh about it, treat it as a "third thing" (not reducible to the perspective of either party), and recognize that these are part of relationships that need to be aired and dealt with as best you can. It is somewhat refreshing to hear that differences lie at the heart of marriage, rather than a rationale for its dissolution!

Link to Learning

Listen to NPR's *Act One: What Really Happens in Marriage* to hear John Gottman talk about his work.

Parenting in Later Life

Just because children grow up does not mean their family stops being a family, rather the specific roles and expectations of its members change over time. One major change comes when a child reaches adulthood and moves away. When exactly children leave home varies greatly depending on societal norms and expectations, as well as on economic conditions such as employment

opportunities and affordable housing options. Some parents may experience sadness when their adult children leave the home—a situation called an **empty nest**.

Many parents are also finding that their grown children are struggling to launch into independence. It's an increasingly common story: a child goes off to college and, upon graduation, is unable to find steady employment. In such instances, a frequent outcome is for the child to return home, becoming a "boomerang kid." The boomerang generation, as the phenomenon has come to be known, refers to young adults, mostly between the ages of 25 and 34, who return home to live with their parents while they strive for stability in their lives—often in terms of finances, living arrangements, and sometimes romantic relationships. These boomerang kids can be both good and bad for families. Within American families, 48% of boomerang kids report having paid rent to their parents, and 89% say they help out with household expenses—a win for everyone (Parker, 2012). On the other hand, 24% of boomerang kids report that returning home hurts their relationship with their parents (Parker, 2012). For better or for worse, the number of children returning home has been increasing around the world. The Pew Research Center (2016) reported that the most common living arrangement for people aged 18-34 was living with their parents (32.1%).

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Adult children typically maintain frequent contact with their parents, if for no other reason, money, and advice. Attitudes toward one's parents may become more accepting and forgiving, as parents are seen in a more objective way, as people with good points and bad. As adults children can continue to be subjected to criticism, ridicule, and abuse at the hand of parents. How long are we "adult children"? For as long as our parents are living, we continue in the role of son or daughter. (I had a neighbor in her nineties who would tell me her "boys" were coming to see her this weekend. Her boys were in their 70s-but they were still her boys!) But after one's parents are gone, the adult is no longer a child; as one 40-year-old man explained after the death of his father, "I'll never be a kid again."

Family Issues and Considerations

In addition to middle-aged parents spending more time, money, and energy taking care of their adult children, they are also increasingly taking care of their own aging and ailing parents. Middle-aged people in this set of circumstances are commonly referred to as the **sandwich generation** (Dukhovnov & Zagheni, 2015). Of course, cultural norms and practices again come into play. In some Asian and Hispanic cultures, the expectation is that adult children are supposed to take care of aging parents and parents-in-law. In other Western cultures—cultures that emphasize individuality and self-sustainability—the expectation has historically been that elders either age in place, modifying their home and receiving services to allow them to continue to live independently, or enter long-term care facilities. However, given financial constraints, many families find themselves taking in and caring for their aging parents, increasing the number of multigenerational homes around the world.

Being a midlife child often involves **kinkeeping**; organizing events and communication in order to maintain family ties. This role was first defined by Carolyn Rosenthal (1985). Kinkeepers are often midlife daughters (they are the person who tells you what food to bring to a gathering, or makes arrangement for a family reunion). They can often function as "managers" who maintain family ties and lines of communication. This is true for both large nuclear families, reconstituted, and multi-generational families. Rosenthal found that over half of the families she sampled were capable of identifying the individual who performed this role. Often adults at this stage of their lives are pressed into caregiving roles. Often referred to as the "sandwich generation", they are still looking out for their own children while simultaneously caring for elderly parents. Given shifts in longevity and increasing costs for professional care of the elderly, this role will likely expand, placing ever greater pressure on careers.

Abuse in Family Life

Abuse can occur in multiple forms and across all family relationships. Breiding, Basile, Smith, Black, & Mahendra (2015) define the forms of abuse as:

- **Physical abuse:** the use of intentional physical force to cause harm. Scratching, pushing, shoving, throwing, grabbing, biting, choking, shaking, slapping, punching, and hitting are common forms of physical abuse
- **Sexual abuse:** the act of forcing someone to participate in a sex act against his or her will. Such abuse is often referred to as sexual assault or rape. A marital relationship does not grant anyone the right to demand sex or sexual activity from anyone, even a spouse
- **Psychological abuse:** aggressive behavior that is intended to control someone else. Such abuse can include threats of physical or sexual abuse, manipulation, bullying, and stalking.

Abuse between partners is referred to as intimate partner violence; however, such abuse can also occur between a parent and child (child abuse), adult children and their aging parents (elder abuse), and even between siblings.

The most common form of abuse between parents and children is that of neglect. Neglect refers to a family's failure to provide for a child's basic physical, emotional, medical, or educational needs (DePanfilis, 2006). Harry Potter's aunt and uncle, as well as Cinderella's stepmother, could all be prosecuted for neglect in the real world.

Abuse is a complex issue, especially within families. There are many reasons people become abusers: poverty, stress, and substance abuse are common characteristics shared by abusers, although abuse can happen in any family. There are also many reasons adults stay in abusive relationships: (a) learned helplessness (the abused person believing he or she has no control

over the situation); (b) the belief that the abuser can/will change; (c) shame, guilt, self-blame, and/or fear; and (d) economic dependence. All of these factors can play a role.

Children who experience abuse may "act out" or otherwise respond in a variety of unhealthy ways. These include acts of self-destruction, withdrawal, and aggression, as well as struggles with depression, anxiety, and academic performance. Researchers have found that abused children's brains may produce higher levels of stress hormones. These hormones can lead to decreased brain development, lower stress thresholds, suppressed immune responses, and lifelong difficulties with learning and memory (Middlebrooks & Audage, 2008).

Happy Healthy Families

Our families play a crucial role in our overall development and happiness. They can support and validate us, but they can also criticize and burden us. For better or worse, we all have a family. In closing, here are strategies you can use to increase the happiness of your family:

- Teach morality—fostering a sense of moral development in children can promote well-being (Damon, 2004).
- Savor the good—celebrate each other's successes (Gable, Gonzaga & Strachman, 2006).
- Use the extended family network—family members of all ages, including older siblings and grandparents, who can act as caregivers can promote family well-being (Armstrong, Birnie-Lefcovitch & Ungar, 2005).
- Create family identity—share inside jokes, fond memories, and frame the story of the family (McAdams, 1993).
- Forgive—Don't hold grudges against one another (McCullough, Worthington & Rachal, 1997).

Divorce and Remarriage

Divorce

Divorce refers to the legal dissolution of a marriage. Depending on societal factors, divorce may be more or less of an option for married couples. Despite popular belief, divorce rates in the United States actually declined for many years during the 1980s and 1990s, and only just recently started to climb back up—landing at just below 50% of marriages ending in divorce today (Marriage & Divorce, 2016); however, it should be noted that divorce rates increase for each subsequent marriage, and there is considerable debate about the exact divorce rate. Are there specific factors that can predict divorce? Are certain types of people or certain types of relationships more or less at risk for breaking up? Indeed, there are several factors that appear to be either risk factors or protective factors.

Pursuing education decreases the risk of divorce. So too does waiting until we are older to marry. Likewise, if our parents are still married we are less likely to divorce. Factors that increase our risk of divorce include having a child before marriage and living with multiple partners before marriage, known as serial cohabitation (cohabitation with one's expected marital partner does not appear to have the same effect). Of course, societal and religious attitudes must also be taken into account. In societies that are more accepting of divorce, divorce rates tend to be higher. Likewise, in religions that are less accepting of divorce, divorce rates tend to be lower. See Lyngstad & Jalovaara (2010) for a more thorough discussion of divorce risk.

Divorce Factors	
Protective Factors	**Risk Factors**
• Higher-levels of education	• Children before marriage
• Marrying at older age	• Co-habitation
• Parents remain married	• Live in a society accepting of divorce
• Member of religious group less accepting of divorce	

Figure 2. *Factors of divorce.*

If a couple does divorce, there are specific considerations they should take into account to help their children cope. Parents should reassure their children that both parents will continue to love them and that the divorce is in no way the children's fault. Parents should also encourage open communication with their children and be careful not to bias them against their "ex" or use them as a means of hurting their "ex" (Denham, 2013; Harvey & Fine, 2004; Pescosoido, 2013).

A "Gray Divorce Revolution"?

In 2013 Brown and Lin referred to a "gray divorce revolution". The figures certainly seem to support their contention. The rate of divorce had doubled for those aged 50-64 in the twenty years between 1990 and 2010. One in 10 persons who divorced in 1990 was over age 50, by 2010 it was over 1 in 4, accounting for some 25% of all

divorces in the USA. Various explanations have been offered for this phenomenon. The "baby boomers" had divorced in large numbers in early adulthood, and a large number of remarriages within this group also ended in divorce. Remarriages are about 2.5 times more likely to end in divorce than first marriages. People are living longer and are no longer satisfied with relationships deemed insufficient to meet their emotional needs. The shift to companionate marriage in the latter half of the 20th century had followed this segment of the population into midlife, with divorce rates diminishing or stabilizing for other segments of the population.

Socio-emotional selectivity theory would predict that the shift of perspective from time spent to time remaining would predict people valuing experiences and relationships in the present, rather than holding onto memories of the past, or an idealized vision of what might yet come to be. Nevertheless, Cohen (2018) predicts a substantial decline in divorce rates for those who are not part of the "baby boom" generation, and that marriage rates will stabilize once more in subsequent generational cohorts. There has been a marked decline in divorce rates for those under 45 and the link between college education and marriage is now quite pronounced. People are now waiting until later in life to marry for the first time. The average age is now 27 for women and 29 for men, and it is even higher in urban centers like NYC. However, Reeves et al (2016) show that just over half of women with high school diplomas in their 40s are married, with the figures rising to 75% of those women with Bachelor's degrees. Increasing economic insecurity may have played a part in ensuring that marriage may increasingly be correlated with educational attainment and socioeconomic status rather than cohorts based solely on age.

U.S. households are now increasingly single-person households. The number is reckoned to be in excess of 28% of all households, and may become the most common form in the near future, if trends in Europe are anything to go by. There, the number of one-person households in countries and Denmark and Germany exceeds 40%, with other major European countries like France not far from

reaching that proportion. The number of Americans who are unmarried continues to increases. About 45% of all Americans over the age of 18 are unmarried, in 1960 that number was 28% (US Census, 2017). Around 1 in 4 young adults in the USA today will never marry (Pew, 2014). The diversity of households will continue to increase. Currently, the number of one-person households in Japan and Germany is double that of households with children under 18.

Remarriage and Repartnering

Middle adulthood seems to be the prime time for remarriage, as the Pew Research Center reported in 2014 that of those aged between 55-64 who had previously been divorced, 67% had remarried. In 1960, it was 55%. Every other age category reported declines in the number of remarriages. Notably, remarriage is more popular with men than women, a gender gap that not only persists, but grows substantially in middle and later adulthood. Cohabitation is the main way couples prepare for remarriage, but even when living together, many important issues are still not discussed. Issues concerning money, ex-spouses, children, visitation, future plans, previous difficulties in marriage, etc. can all pose problems later in the relationship. Few couples engage in premarital counseling or other structured efforts to cover this ground before entering into marriage again.

The divorce rate for second marriages is reckoned to be in excess of 60%, and for third marriages even higher. There is little research in the area of repartnering and remarriage, and the choices and decisions made during the process. A notable exception is that of Brown et al (2019) who offer an overview of the little that there is, and their own conclusions. One important constraint which they note is that men prefer younger women, at least as far as remarriage is concerned. Indeed, the gap in age is often more pronounced in

second marriages than in the first, according to Pew (2014). Allied to the fact that women live, on average, five years longer in the USA, then the pool of available partners shrinks for women. Brown et al (2019), also argue that this is further reinforced by the fact that women have a preference for retaining their autonomy and not playing the role of caregiver again. Perhaps the most interesting aspect of their research is the fact that those who repartner tend to do so quickly, and that longer-term singles are more likely to remain so.

Reviews are mixed as to how happy remarriages are. Some say that they have found the right partner and have learned from mistakes. But the divorce rates for remarriages are higher than for first marriages. This is especially true in stepfamilies for reasons which we have already discussed. People who have remarried tend to divorce more quickly than those first marriages. This may be due to the fact that they have fewer constraints on staying married (are more financially or psychologically independent).

Factors Affecting Remarriage

The chances of remarrying depend on a number of things. First, it depends on the availability of partners. As time goes by, there are more available women than men in the marriage pool as noted above. Consequently, men are more likely than women to remarry. This lack of available partners is experienced by all women, but especially by African-American women where the ratio of women to men is quite high. Women are more likely to have children living with them, and this diminishes the chance of remarriage as well. And marriage is more attractive for males than females (Seccombe & Warner, 2004). Men tend to remarry sooner (3 years after divorce on average vs. 5 years on average for women).

Many women do not remarry because they do not want to remarry. Traditionally, marriage has provided more benefits to men

than to women. Women typically have to make more adjustments in work (accommodating work life to meet family demands or the approval of the husband) and at home (taking more responsibility for household duties). Education increases men's likelihood of remarrying but may reduce the likelihood for women. Part of this is due to the expectation (almost an unspoken rule) referred to as the "marriage gradient." This rule suggests among couples, the man is supposed to have more education than the woman. Today, there are more women with higher levels of education than before and women with higher levels are less likely to find partners matching this expectation. Being happily single requires being economically self-sufficient and being psychologically independent. Women in this situation may find remarriage much less attractive.

One key factor in understanding some of these issues is the level of continuing parental investment in adult children, and possibly their children. The number of grandparents raising children in the USA is reckoned to be in the vicinity of 2.7 million. In addition, there is the continued support of adult children themselves which can be substantial. The Pew Research document "Helping Adult Children" (2015) gives some indication of the nature and extent of this support, which tends to be even greater in Europe than the USA, with 60% of Italian parents reporting an adult child residing with them most of the year.

Blended Families

Most academic research on reconstituted or blended families focuses on younger adults and the kind of difficulties that ensue when trying to blend children raised by a different spouse/partner and one or more adults with perhaps different views or experience on how this might be accomplished. All sorts of issues can arise: conflicted loyalties, different attitudes to discipline, role-ambiguity, and the simple fact of a far-reaching change easily perceived as a

disruption on the part of a child. Given the rise of the gray divorce, it is increasingly the case that this age group will encounter later age, or adult children (sometimes called the "boomerang generation"), in the house of their new partners. Such encounters are even more likely given the rise of the so-called "silver surfer" utilizing online dating sites, and the fact that an increasing number of adult children continue to live at home given the increased cost of housing.

There has not been substantial research on recoupling and blended families in later life, but Papernow (2018) notes that all of the factors normally in play with younger children can be just as present, and even exacerbated, by the fact that previous relationships have had an even longer time to grow and solidify. In addition, stepfamilies formed in later life may have very difficult and complicated decisions to make about estate planning and elder care, as well as navigating daily life together, as an increasing number of young adults live at home ("grown but not gone"). Papernow lists five challenges for later-life stepfamilies:

- Stepparents are stuck as outsiders, while parents are the insiders in their relationships with their families.
- Stepchildren struggle with the change, even as adults, as they navigate new dynamics in family gatherings, status, and loyalty issues
- Parenting and discipline issues polarize the parents and stepparents. In general, stepparents want more discipline and are viewed as harsher, while parents want more understanding and are viewed more as the pushover. There are often disagreements about how much support (financial, physical, and emotional) to give older children.
- Stepfamilies must build a new family culture, even after there are already at least two established family cultures coming together.
- Ex-spouses are still part of a stepfamily, and children, even adult children, are worse off when they are involved in the conflict between their parents ex-spouses.

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Psychosocial Development in Late Adulthood

Our ideas about aging, and what it means to be over 50, over 60, or even over 90, seem to be stuck somewhere back in the middle of the 20th century. We still consider 65 as standard retirement age, and we expect everyone to start slowing down and moving aside for the next generation as their age passes the half-century mark. In this section we explore psychosocial developmental theories, including Erik Erikson's theory on psychosocial development in late adulthood, and we look at aging as it relates to work, retirement, and leisure activities for older adult. We'll also examine ways in which people are productive in late adulthood.

Psychosocial Development in Late Adulthood

Erikson: Integrity vs. Despair

As a person grows older and enters into the retirement years, the pace of life and productivity tend to slow down, granting a person time for reflection upon their life. They may ask the existential question, "It is okay to have been me?" If someone sees themselves as having lived a successful life, they may see it as one filled with productivity, or according to Erik Erikson, integrity.

Here integrity is said to consist of the ability to look back on one's life with a feeling of satisfaction, peace and gratitude for all that has been given and received. Erikson (1959/1980) notes in this regard:

> "The possessor of integrity is ready to defend the dignity of his own lifestyle against all physical and economic treats. For he knows that an individual life is the accidental coincidence of but one life cycle within but one segment of history; and that for him all human integrity stands and falls with the one style of integrity of which he partakes." (Erikson, 1959/1980, p. 104)

Thus, persons derive a sense of meaning (i.e., integrity) through careful review of how their lives have been lived (Krause, 2012). Ideally, however, integrity does not stop here, but rather continues to evolve into the virtue of wisdom. According to Erikson, this is the goal during this stage of life.

If a person see's their life as unproductive, or feel that they did not accomplish their life goals, they may become dissatisfied with life and develop what Erikson calls despair, often leading to depression and hopelessness. This stage can occur out of the sequence when an individual feels they are near the end of their life (such as when receiving a terminal disease diagnosis).

Erikson's Ninth Stage

***Figure 1**. Erikson emphasized the importance of integrity, and feeling a sense of accomplishment as an older person looks back on their life.*

Erikson collaborate with his wife, Joan, through much of his work on psychosocial development. In the Erikson's older years, they re-examined the eight stages and created additional thoughts about how development evolves during a person's 80s and 90s. After Erik Erikson passed away in 1994, Joan published a chapter on the ninth stage of development, in which she proposed (from her own experiences and Erik's notes) that older adults revisit the previous eight stages and deal with the previous conflicts in new ways, as they cope with the physical and social changes of growing old. In the first eight stages, all of the conflicts are presented in a syntonic-dystonic matter, meaning that the first term listed in the conflict is the positive, sought-after achievement and the second term is the less-desirable goal (ie. trust is more desirable than mistrust and integrity is more desirable than despair). During the ninth stage, Erikson argues that the dystonic, or less desirable outcome, comes to take precedence again. For example, an older adult may become mistrustful (trust vs. mistrust), feel more guilt about not having the abilities to do what they once did (initiative vs. guilt), feel less competent compared with others (industry vs. inferiority) lose a sense of identity as they become dependent on others (identity vs. role confusion), become increasingly isolated (intimacy vs. isolation), feel that they have less to offer society (generativity vs. stagnation). The Eriksons found that those who successfully come to terms with these changes and adjustments in later life make headway towards gerotrancendence, a term coined

by gerontologist Lars Tornstam to represent a greater awareness of one's own life and connection to the universe, increased ties to the past, and a positive, transcendent, perspective about life.

Activity Theory

Developed by Havighurst and Albrecht in 1953, activity theory addresses the issue of how persons can best adjust to the changing circumstances of old age–e.g., retirement, illness, loss of friends and loved ones through death, etc. In addressing this issue they recommend that older adults involve themselves in voluntary and leisure organizations, child care and other forms of social interaction. **Activity theory** thus strongly supports the avoidance of a sedentary lifestyle and considers it essential to health and happiness that the older person remains active physically and socially. In other words, the more active older adults are the more stable and positive their self-concept will be, which will then lead to greater life satisfaction and higher morale (Havighurst & Albrecht, 1953). Activity theory suggests that many people are barred from meaningful experiences as they age, but older adults who continue to want to remain active can work toward replacing opportunities lost with new ones.

Disengagement Theory

Disengagement theory, developed by Cumming and Henry in the 1950s, in contrast to activity theory, emphasizes that older adults should not be discouraged from following their inclination towards solitude and greater inactivity. While not completely discounting the importance of exercise and social activity for the upkeep of physical health and personal well being, disengagement theory is

opposed to artificially keeping the older person so busy with external activities that they have no time for contemplation and reflection (Cumming & Henry, 1961). In other words, disengagement theory posits that older adults in all societies undergo a process of adjustment which involves leaving former public and professional roles and narrowing their social horizon to the smaller circle of family and friends. This process enables the older person to die more peacefully, without the stress and distractions that come with a more socially involved life. The theory suggests that during late adulthood, the individual and society mutually withdraw. Older people become more isolated from others and less concerned or involved with life in general. This once popular theory is now criticized as being ageist and used in order to justify treating older adults as second class citizens.

Continuity Theory

Continuity theory suggests as people age, they continue to view the self in much the same way as they did when they were younger. An older person's approach to problems, goals, and situations is much the same as it was when they were younger. They are the same individuals, but simply in older bodies. Consequently, older adults continue to maintain their identity even as they give up previous roles. For example, a retired Coast Guard commander attends reunions with shipmates, stays interested in new technology for home use, is meticulous in the jobs he does for friends or at church, and displays mementos from his experiences on the ship. He is able to maintain a sense of self as a result. People do not give up who they are as they age. Hopefully, they are able to share these aspects of their identity with others throughout life. Focusing on what a person can do and pursuing those interests and activities is one way to optimize and maintain self-identity.

Generativity in Late Adulthood

People in late adulthood continue to be productive in many ways. These include work, education, volunteering, family life, and intimate relationships. Older adults also experience generativity (recall Erikson's previous stage of generativity vs. stagnation) through voting, forming and helping social institutions like community centers, churches and schools. Psychoanalyst Erik Erikson wrote "I am what survives me."

Productivity in Work

***Figure 2**. Many choose to retire at age 65, but some enjoy a productive work life well beyond their 60s.*

Some continue to be productive in work. Mandatory retirement is now illegal in the United States. However, many do choose retirement by age 65 and most leave work by choice. Those who do leave by choice adjust to retirement more easily. Chances are, they have prepared for a smoother transition by gradually giving more attention to an avocation or interest as they approach retirement. And they are more likely to be financially ready to retire. Those who must leave abruptly for health reasons or because of layoffs or downsizing have a more difficult time adjusting to their new circumstances. Men, especially, can find unexpected retirement difficult. Women may feel less of an identify loss after retirement because much of their identity may have come from family roles as well. But women tend to have poorer retirement funds accumulated from work and if they take their retirement funds in a lump sum (be that from their own or from a deceased

husband's funds), are more at risk of outliving those funds. Women need better financial retirement planning.

Sixteen percent of adults over 65 were in the labor force in 2008 (U. S. Census Bureau 2011). Globally, 6.2 percent are in the labor force and this number is expected to reach 10.1 million by 2016. Many adults 65 and older continue to work either full-time or part-time either for income or pleasure or both. In 2003, 39 percent of full-time workers over 55 were women over the age of 70; 53 percent were men over 70. This increase in numbers of older adults is likely to mean that more will continue to part of the workforce in years to come. (He et al., article, U. S. Census, 2005).

Volunteering: Face-to-face and Virtually

About 40 percent of older adults are involved in some type of structured, face-to-face, volunteer work. But many older adults, about 60 percent, engage in a sort of informal type of volunteerism helping out neighbors or friends rather than working in an organization (Berger, 2005). They may help a friend by taking them somewhere or shopping for them, etc. Some do participate in organized volunteer programs but interestingly enough, those who do tend to work part-time as well. Those who retire and do not work are less likely to feel that they have a contribution to make. (It's as if when one gets used to staying at home, their confidence to go out into the world diminishes.) And those who have recently retired are more likely to volunteer than those over 75 years of age.

New opportunities exist for older adults to serve as virtual volunteers by dialoguing online with others from around their world and sharing their support, interests, and expertise. According to an article from AARP (American Association of Retired Persons), virtual volunteerism has increased from 3,000 in 1998 to over 40,000 participants in 2005. These volunteer opportunities range from helping teens with their writing to communicating with 'neighbors' in villages of developing countries. Virtual volunteering is available

to those who cannot engage in face-to-face interactions and opens up a new world of possibilities and ways to connect, maintain identity, and be productive (Uscher, 2006).

Education

Twenty percent of people over 65 have a bachelors or higher degree. And over 7 million people over 65 take adult education courses (U. S. Census Bureau, 2011). Lifelong learning through continuing education programs on college campuses or programs known as "Elderhostels" which allow older adults to travel abroad, live on campus and study provide enriching experiences. Academic courses as well as practical skills such as computer classes, foreign languages, budgeting, and holistic medicines are among the courses offered. Older adults who have higher levels of education are more likely to take continuing education. But offering more educational experiences to a diverse group of older adults, including those who are institutionalized in nursing homes, can enhance the quality of life.

Religious Activities

People tend to become more involved in prayer and religious activities as they age. This provides a social network as well as a belief system which can combats the fear of death. Religious activities provide a focus for volunteerism and other activities as well. For example, one elderly woman prides herself on knitting prayer shawls that are given to those who are sick. Another serves on the alter guild and is responsible for keeping robes and linens clean and ready for communion.

Political Activism

The elderly are very politically active. They have high rates of voting and engage in letter writing to congress on issues that not only affect them, but on a wide range of domestic and foreign concerns. In the past three presidential elections, over 70 percent of people 65 and older showed up at the polls to vote (U. S. Census Bureau).

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Attitudes about Aging

Stereotypes about people of in late adulthood lead many to assume that aging automatically brings poor health and mental decline. These stereotypes are reflected in everyday conversations,

the media and even in greeting cards (Overstreet, 2006). The following examples serve to illustrate.

> 1) Grandpa, fishing pole in one hand, pipe in the other, sits on the ground and completes a story being told to his grandson with ". . . and that, Jimmy, is the tale of my very first colonoscopy." The message inside the card reads, "Welcome to the gross personal story years." (Shoebox, A Division of Hallmark Cards.)
>
> 2) An older woman in a barber shop cuts the hair of an older, dozing man. "So, what do you say today, Earl?" she asks. The inside message reads, "Welcome to the age where pretty much anyplace is a good place for a nap." (Shoebox, A Division of Hallmark Cards.)
>
> 3) A crotchety old man with wire glasses, a crumpled hat, and a bow tie grimaces and the card reads, "Another year older? You're at the age where you should start eatin' right, exercisin', and takin' vitamins . . ." The inside reads, "Of course you're also at the age where you can ignore advice by actin like you can't hear it." (Hallmark Cards, Inc.)

***Figure 3**. Word used to describe the elderly are often negative and biased. Research by the Australain Human Rights Commusion polled people on the following question: "Thinking about everything you see and hear in the media (including on TV, online, on the radio and in newspapers and magazines), how does the media portray older people?" Their responses are listed here, with the larger words being listed more often. Retrieved from the https://www.humanrights.gov.au/our-work/chapter-4-role-and-influence-media.*

Of course, these cards are made because they are popular. Age is not revered in the United States, and so laughing about getting older is one way to get relief. The attitudes above are examples of ageism, prejudice based on age. **Ageism** is prejudice and discrimination that is directed at older people. This view suggests that older people are less in command of their mental faculties. Older people are viewed more negatively than younger people on a variety of traits, particularly those relating to general competence and attractiveness. Stereotypes such as these can lead to a self-fulfilling prophecy in which beliefs about one's ability results in actions that make it come true.

Ageism is a modern and predominately western cultural phenomenon—in the American colonial period, long life was an indication of virtue, and Asian and Native American societies view older people as wise, storehouses of information about the past, and deserving of respect. Many preindustrial societies observed **gerontocracy**, a type of social structure wherein the power is held by a society's oldest members. In some countries today, the elderly still have influence and power and their vast knowledge is respected, but this reverence has decreased in many places due to social factors. A positive,

Figure 4. *What comes to mind when you think about an elderly person? Do you view this picture of an older gentleman as positive or negative, capable and independent or frail and needing assistance?*

optimistic outlook about aging and the impact one can have on improving health is essential to health and longevity. Removing societal stereotypes about aging and helping older adults reject those notions of aging is another way to promote health in older populations.

In addition to ageism, racism is yet another concern for minority populations as they age. The number of blacks above the age if 65 is projected to grow from around 4 million now to 12 million by 2060. Racism towards blacks and other minorities throughout the lifetime results in many older minorities having fewer resources, more chronic health conditions, and significant health disparities when compared ~~against~~ to older white Americans. Racism towards older adults from diverse backgrounds has resulted in-them having limited access to community resources such as grocery stores, housing, health care providers, and transportation.

Elderly Abuse

Nursing homes have been publicized as places where older adults are at risk of abuse. Abuse and neglect of nursing home residents is more often found in facilities that are run down and understaffed. However, older adults are more frequently abused by family members. The most commonly reported types of abuse are financial abuse and neglect. Victims are usually very frail and impaired and perpetrators are usually dependent on the victims for support. Prosecuting a family member who has financially abused a parent is very difficult. The victim may be reluctant to press charges and the court dockets are often very full resulting in long waits before a case is heard. “Granny dumping” or the practice of family members abandoning older family members with severe disabilities in emergency rooms is a growing problem; an estimated 100,000 and 200,000 are dumped each year (Tanne in Berk, 2007).

Watch It

This clip from the Big Think examines some of the negative prejudices about the elderly.

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You can watch another video from Ashton Applewhite in this TED talk "Let's End Ageism."

Try It

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Relationships in Late Adulthood

During late adulthood, many people find that their relationships with their adult children, siblings, spouses, or life partners change. Roles may also change, as many are grandparents or great-grandparents, caregivers to even older parents or spouses, or receivers of care in a nursing home or other care facility.

Grandparenting

Figure 5*. Grandparenting styes can vary depending on a variety of factors such as relationships, personality, and proximity.*

It has become increasingly common for grandparents to live with and raise their grandchildren, or also to move back in with adult children in their later years. According to the U.S. Census Bureau, there were 2.7 million grandparents raising their grandchildren in 2009. The dramatic increase in grandparent-headed households has been attributed to many factors including parental substance abuse.

Grandparenting typically begins in midlife rather than late adulthood, but because people are living longer, they can anticipate being grandparents for longer periods of time. Cherlin and Furstenberg (1986) describe three styles of grandparents:

1. Remote: These grandparents rarely see their grandchildren. Usually they live far away from the grandchildren, but may also have a distant relationship. Contact is typically made on special occasions such as holidays or birthdays. Thirty percent of the grandparents studied by Cherlin and Furstenberg were remote.
2. Companionate Grandparents: Fifty-five percent of grandparents studied were described as companionate. These grandparents do things with the grandchild but have little

authority or control over them. They prefer to spend time with them without interfering in parenting. They are more like friends to their grandchildren.

3. Involved Grandparents: Fifteen percent of grandparents were described as involved. These grandparents take a very active role in their grandchild's life. The grandchildren might even live with the grandparent. The involved grandparent is one who has frequent contact with and authority over the grandchild.

An increasing number of grandparents are raising grandchildren today. Issues such as custody, visitation, and continued contact between grandparents and grandchildren after parental divorce are contemporary concerns.

Marriage and Divorce

Most males and females aged 65 and older had been married at some point in their lives. According to the U.S. Census Bureau, 2016 American Community Survey, among the population 65 and older, males were significantly more likely to be married (70 percent) compared with females (44 percent) in the same age group. Even at the oldest age group, 85 and older, 54 percent of males were still married compared with 15 percent of females.

Twelve percent of older men and 15% percent of older women have been divorced and about 6 percent of older adults have never married. Many married couples feel their marriage has improved with time and the emotional intensity and level of conflict that might have been experienced earlier, has declined. This is not to say that bad marriages become good ones over the years, but that those marriages that were very conflict-ridden may no longer be together, and that many of the disagreements couples might have had earlier in their marriages may no longer be concerns. Children have grown and the division of labor in the home has probably been

established. Men tend to report being satisfied with marriage more than do women. Women are more likely to complain about caring for a spouse who is ill or accommodating a retired husband and planning activities. Older couples continue to engage in sexual activity, but with less focus on intercourse and more on cuddling, caressing, and oral sex (Carroll, 2007).

Divorce after long-term marriage does occur, but is not as common as earlier divorces, despite rising divorce rates for those above age 65. Older adults who have been divorced since midlife tend to have settled into comfortable lives and, if they have raised children, to be proud of their accomplishments as single parents. Remarriage is also on the rise for older adults; in 2014, 50% of adults ages 65 and older had remarried, up from 34% in 1960. Men are also more likely to remarry than women.

Figure 6. *Both divorce and remarriage are on the rise for older Americans.*

Widowhood

With increasing age, women were less likely to be married or divorced but more likely to be widowed, reflecting a longer life expectancy relative to men. About 2 out of 10 women aged 65 to 74 were widowed compared with 4 out of 10 women aged 75 to 84 and 7 out of 10 women 85 and older. More than twice as many women 85 and older were widowed (72 percent) compared to men of the same age (35 percent). The death of a spouse is one of life's most disruptive experiences. It is especially hard on men who lose their wives. Often widowers do not have a network of friends or family members to fall back on and may have difficulty expressing

their emotions to facilitate grief. Also, they may have been very dependent on their mates for routine tasks such as cooking, cleaning, etc.

Widows may have less difficulty because they do have a social network and can take care of their own daily needs. They may have more difficulty financially if their husband's have handled all the finances in the past. They are much less likely to remarry because many do not wish to and because there are fewer men available. At 65, there are 73 men to every 100 women. The sex ratio becomes even further imbalanced at 85 with 48 men to every 100 women (U. S. Census Bureau, 2011).

Loneliness or solitude?

Loneliness is a discrepancy between the social contact a person has and the contacts a person wants (Brehm et al., 2002). It can result from social or emotional isolation. Women tend to experience loneliness as a result of social isolation; men from emotional isolation. Loneliness can be accompanied by a lack of self-worth, impatience, desperation, and depression. This can lead to suicide, particularly in older, white men who have the highest suicide rates of any age group; higher than Blacks, and higher than for females. Rates of suicide continue to climb and peaks in males after age 85 (National Center for Health Statistics, CDC, 2002).

Being alone does not always result in loneliness. For some, it means solitude. Solitude involves gaining self-awareness, taking care of the self, being comfortable alone, and pursuing one's interests (Brehm et al., 2002).

Couples who remarry after midlife, tend to be happier in their marriages than in first marriage. These partners are likely to be more financially independent, have children who are grown, and enjoy a greater emotional wisdom that comes with experience.

Single, Cohabiting, and Remarried Older Adults

About 6 percent of adults never marry. Many have long-term relationships, however. The never married tend to be very involved in family and care giving and do not appear to be particularly unhappy during late adulthood, especially if they have a healthy network of friends. Friendships tend to be an important influence in life satisfaction during late adulthood. Friends may be more influential than family members for many older adults. According to **socioemotional selectivity theory**, older adults become more selective in their friendships than when they were younger (Carstensen, Fung, & Charles, 2003). Friendships are not formed in order to enhance status or careers, and may be based purely on a sense of connection or the enjoyment of being together. Most elderly people have at least one close friend. These friends may provide emotional as well as physical support. Being able to talk with friends and rely on others is very important during this stage of life.

About 4 percent of older couples chose cohabitation over marriage (Chevan, 1996). The Pew Research Center reported in 2017 that the number of cohabiters over age 50 rose to 4 million from 2.3 million over the decade, and found the number over age 65 doubled to about 900,000. As discussed in our lesson on early adulthood, these couples may prefer cohabitation for financial reasons, may be same-sex couples who cannot legally marry, or couples who do not want to marry because of previous dissatisfaction with marital relationships.

Elderly and LBGTQ+

There has been a growth of interest

in lesbian, gay, bisexual, transgender, and queer (LGBTQ+) aging in recent years. Many retirement issues for lesbian, gay, bisexual, transgender (LGBT) and intersex people are unique from their non-LGBTI counterparts and these populations often have to take extra steps addressing their employment, health, legal and housing concerns to ensure their needs are met. Throughout the United States, there are 1.5 million adults over the age of 65 who identify as lesbian, gay, or bisexual, and two million people above the age of 50 who identify as such. That number is expected to double by 2030, as estimated in a study done by the Institute for Multigenerational Health at the University of Washington. While LGBTQ+ people have increasingly become more visible and accepted into mainstream cultures, LGBTQ+ elders and retirees are still considered a newer phenomenon, which creates both challenges and opportunities as they redefine some commonly held beliefs about aging.

LGBTQ+ individuals are less likely to have strong family support systems in place to have relatives to care for them during aging. They are twice as likely to enter old age living as a single person; and two and a half times more likely to live alone. Because institutionalized homophobia as well as cultural discrimination and harassment still exist, they are less likely to access health care, housing, or social services or when they do, find the experience stressful or demeaning. Joel Ginsberg, executive director of the Gay Lesbian Medical Association, asserts "only by pursuing both strategies, encouraging institutional change and encouraging…and empowering individuals to ask for what they want will we end up with quality care for LGBT people."

These older adults have concerns over health insurance, being able to share living quarters in nursing homes and assisted living residences where staff members tend not to be accepting of homosexuality and bisexuality. SAGE (Senior Action in a Gay Environment) is an advocacy group

working on remedying these concerns. Same-sex couples who have endured prejudice and discrimination through the years and can rely upon one another continue to have support through late adulthood.

LGBTQ+ Aging Centers have opened in several major metropolitan areas with the goal of training long-term care providers about LGBT-specific issues, an area of frequent discrimination. Legislative solutions are available as well: "California is the only state with a law saying the gay elderly have special needs, like other members of minority groups. A new law encourages training for employees and contractors who work with the elderly and permits state financing of projects like gay senior centers." Twenty states prohibit discrimination in housing and public accommodation on the basis of sexual orientation.

Older Adults, Caregiving, and Long-Term Care

Older adults do not typically relocate far from their previous places of residence during late adulthood. A minority lives in planned retirement communities that require residents to be of a certain age. However, many older adults live in age-segregated neighborhoods that have become segregated as original inhabitants have aged and children have moved on. A major concern in future city planning and development will be

Population rising in different types of multigenerational households

In millions

	2012	2016
Two adult generations	27.4	32.3
Three or more generations	26.5	28.4
Skipped generations	2.9	3.2

Note: Skipped generation households include grandparents and grandchildren younger than 25.
Source: Pew Research Center analysis of 2012 and 2016 American Community Survey (IPUMS).

PEW RESEARCH CENTER

Figure 7. *More elderly are living in homes with their children or grandchildren.*

whether older adults wish to live in age-integrated or age-segregated communities.

Over 60 million Americans, or 19% of the population, lived in multigenerational households, or homes with at least two adult generations. It has become an ongoing trend for elderly generations to move in and live with their children, as they can give them support and help with everyday living.

Most (70 percent) of older adults who require care receive that care in the home. Most are cared for by their spouse, or by a daughter or daughter-in-law. However, those who are not cared for at home are institutionalized. In 2008, 1.6 million out of the total 38.9 million Americans age 65 and older were nursing home residents (U. S. Census Bureau, 2011). Among 65-74, 11 per 1,000 adults aged 65 and older were in nursing homes. That number increases to 182 per 1,000 after age 85. More residents are women than men, and more are Black than white. As the population of those over age 85 continues to increase, more will require nursing home care. Meeting the psychological and social as well as physical needs of nursing home residents is a growing concern. Rather than focusing primarily on food, hygiene, and medication, quality of life for the seniors within these facilities is important. Residents of nursing homes are sometimes stripped of their identity as their personal possessions and reminders of their life are taken away. A rigid routine in which the residents have little voice can be alienating to anyone, but more so for an older adult. Routines that encourage passivity and dependence can be damaging to self-esteem and lead to further deterioration of health. Greater attention needs to be given to promoting successful aging within institutions.

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Glossary

authoritative parenting: parenting that is both demanding and supportive of the child

authoritarian parenting: parenting style that is high in demandingness and low in support

cohabitation: an arrangement where two people who have not married live together

demandingness: the degree a parent controls their child's behavior

emerging adulthood: life stage extending from approximately ages 18 to 25, during which the foundation of an adult life is gradually constructed in love and work. Primary features include identity explorations, instability, focus on self-development, feeling incompletely adult, and a broad sense of possibilities

filter theory of mate selection: the pool of eligible partners becomes narrower as it passes through filters used to eliminate members of the pool

heterogamy: marriage between people who do not share social characteristics

homogamy: marriage between people who share social characteristics

matching hypothesis: we tend to be attracted to those who are similar to us in age, social class, race, education, physical attractiveness, values, and attitudes

permissive parenting: parenting that is low in demandingness and high in support

proximity: a term for physical nearness which been found to be a significant factor in the development of relationships

reciprocity: we are more likely to like someone if they feel the same way toward us

social exchange theory: people try to maximize rewards and minimize costs in social relationships

uninvolved parenting: parenting that is low in both support and demandingness

DEATH AND DYING

Learning Objectives

- Examine the leading causes of death in the United States and worldwide
- Explain physiological death
- Describe social and psychological death
- Explain common perceptions and attitudes toward death
- Explain bereavement and types of grief
- Explain Kübler-Ross' stages of loss
- List and describe the stages of grief based on various models
- Explain the philosophy and practice of palliative care
- Describe hospice care
- Summarize Dame Cicely Saunders' writings about total pain of the dying
- Differentiate attitudes toward hospice care based on race and ethnicity
- Describe and contrast types of euthanasia and physician-assisted suicide

"Everything has to die," he told her during a telephone conversation.

"I want you to know how much I have enjoyed being with you, having you as my friend, and confidant and what a good father you have been to me. Thank you so much." she told him.

"You are entirely welcome." he replied.

He had known for years that smoking will eventually kill him. But he never expected that lung cancer would take his life so quickly or be so painful. A diagnosis in late summer was followed with radiation and chemotherapy during which time there were moments of hope interspersed with discussions about where his wife might want to live after his death and whether or not he would have a blood count adequate to let him precede with his next treatment. Hope and despair exist side by side. After a few months, depression and quiet sadness preoccupied him although he was always willing to relieve others by reporting that he 'felt a little better' if they asked. He returned home in January after one of his many hospital stays and soon grew worse. Back in the hospital, he was told of possible treatment options to delay his death. He asked his family members what they wanted him to do and then announced that he wanted to go home. He was ready to die. He returned home. Sitting in his favorite chair and being fed his favorite food gave way to lying in the hospital bed in his room and rejecting all food. Eyes closed and no longer talking, he surprised everyone by joining in and singing "Happy birthday" to his wife, son, and daughter-in-law who all had birthdays close together. A pearl necklace he had purchased 2 months earlier in case he died before his wife's birthday was retrieved and she told him how proud she would be as she wore it. He kissed her once and then again as she said goodbye. He died a few days later.

A dying process that allows an individual to make choices about treatment, to say goodbyes and to take care of final arrangements is what many people hope for. Such a death might be considered a "good death." But of course, many deaths do not occur in this way. Not all deaths include such a dialogue with family members or being able to die in familiar surroundings; people may die suddenly and alone, or people may leave home and never return. Children sometimes precede parents in death; wives precede husbands, and the homeless are bereaved by strangers.

In this module, we will look at death and dying, grief and

bereavement, palliative care, and hospice to better understand these last stages of life.

Understanding Death

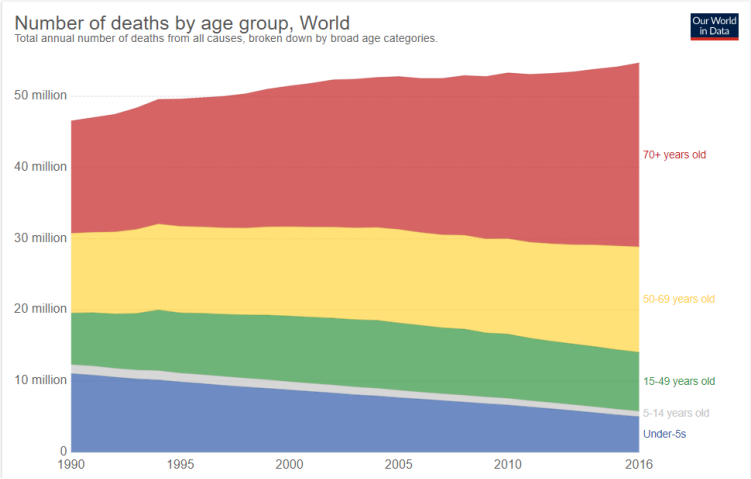

***Figure 1**. With advances in health care, nutrition, and technology, fewer young people are dying. With an aging population, this means that the death rate for those above the age of 70 is steadily growing throughout the world.*

While death has always been a universal component in the human experience, its prevalence and circumstances have changed over the years. Today, we associate death with the elderly, but looking back even one hundred years ago, death was more common among children and in various age ranges. At that time, it was not uncommon for American families to lose a child during childbirth or infancy. Today less than 10% of all deaths worldwide occur to children under the age of 5, but as recently as 1990, that number was nearly 25%.

The graph above shows data from 2016, which reveals that nearly half of the 55 million global deaths occurred to those aged 70 years or older. There is still a great amount of disparity in death statistics based on location and access to medical care. In the United States,

for example, deaths in that same age group of 70 years old or older accounted for 65% of total deaths. In this section, we'll look more closely at the leading causes of death in the United States and throughout the globe.

Most Common Causes of Death

The United States

In 1900, the most common causes of death were infectious diseases, which brought death quickly. Due to advances in healthcare and medicine over the years, this has changed, alongside an increase in average life expectancy. According to national data, chronic diseases, or those in which a slow and steady decline causes health deterioration, were the most common causes of death in the United States in 2016. In addition, accidents were more common than in previous years, often resulting in quick or unexpected death. How might this impact the way we think of death, the way we grieve, and the amount of control a person has over his or her own dying process, in comparison to the infectious diseases that were prevalent in 1900?

The 15 leading causes of death and number of deaths per category in 2016 in the United States are listed below.

Table 1. Leading Causes of Death in the United States

Rank (2016)	Cause of Death	Percentage of total deaths 2016	Percentage of total deaths 2015
1	Heart disease	23.1	23.4
2	Cancer	21.8	22.0
3	Accidents	5.9	5.4
4	Chronic lower respiratory diseases	5.6	5.7
5	Strokes	5.2	5.2
6	Alzheimer's Disease	4.2	4.1
7	Diabetes	2.9	2.9
8	Influenza and Pneumonia	1.9	2.1
9	Kidney Disease	1.8	1.8
10	Suicide	1.6	1.6

These data reflect both similarities and differences when compared with data from 2004. All of these top causes of death, with the

exception of two—accidents and suicides—continue to be related to physical illnesses. Many are linked at least in part to lifestyle choices, including diet, exercise, and substance abuse. Similarly, many are preventable, to some extent, and some are avoidable if the proper actions are taken. Although these causes of death remain the same as they were in 2004, the order has changed for several of them by 2016. For example, accidents and unintentional injuries shifted from #5 in 2004 to #3 in 2016. Alzheimer's disease became slightly more common, moving from #7 to #6, as did suicide, moving from #11 to #10. In contrast, strokes became slightly less common, moving from #3 to #5, along with diabetes, which moved from #6 to #7. Septicemia (blood disease) followed a similar trend, shifting from #10 to #11. These changes are likely attributable to a variety of factors, including lifestyle choices, social pressures and norms, and changes in responsibilities and obligations.

Deadliest Diseases Worldwide

The top 10 deadliest diseases in the world from 2015 are listed below, along with the percentage of deaths for which they were accountable. These reflect disease-related deaths only, and do not reflect deaths due to violence or suicide. Notice there are several similarities between these and the top 15 causes of death in the United States described above.

1. Heart disease – 15.5%
2. Stroke – 11.1%
3. Lower respiratory infections – 5.7%
4. Chronic obstructive pulmonary disease – 5.6%
5. Trachea, bronchus, and lung cancers – 3%
6. Diabetes – 2.8%
7. Alzheimer's disease and other dementia – 2.7%
8. Dehydration due to diarrheal diseases – 2.5%

9. Tuberculosis – 2.4%
10. Cirrhosis – 2.1%

Similar to the top 15 general causes of death listed above, these remained fairly consistent over the years, despite increases and decreases in each. Deaths caused by heart disease, for example, increased from 2000 by 2.8 million, and deaths caused by stroke increased by .5 million. Lung disorders and cancers also rose by .5 million deaths, while diabetes rose by .6 million. Alzheimer's disease and other forms of dementia also accounted for an additional .3 million deaths. Decreases were seen in lower respiratory infections, which decreased by .2 million, as well as dehydration due to diarrheal diseases, which decreased by .8 million. Furthermore, tuberculosis deaths decreased by 1 million, and cirrhosis deaths decreased by .2 million.

While the top 15 causes of death presented previously were only for the United States, these top 10 deadliest diseases are for the entire world, including both developed and undeveloped nations. Differences in various factors including but not limited to economic status, access to medical care, belief systems, and natural resources play a major role in many of these causes of death, and tend to vary substantially between countries. This presents challenges for the interpretation of this list, making it difficult to determine the true prevalence of each in specific locations.

WAtch it

Watch this video to learn about another way to measure and compare life expectancies, known as years of life lost, which measures how many years short of the life expectancy people die. Looking at ~~this~~ these data reveals some of the leading causes of death across the globe.

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A Comparison of Death by Age in the United States

The major causes of death vary significantly among age groups. As you can see in Figure 1, congenital diseases and accidents are major causes of death among children, then accidents and suicides are the leading causes of death between ages 10 and 24. This changes again in~~to~~ middle and late-adulthood, as heart disease and cancer combined cause over 50% of deaths for those aged between 45 and 65.

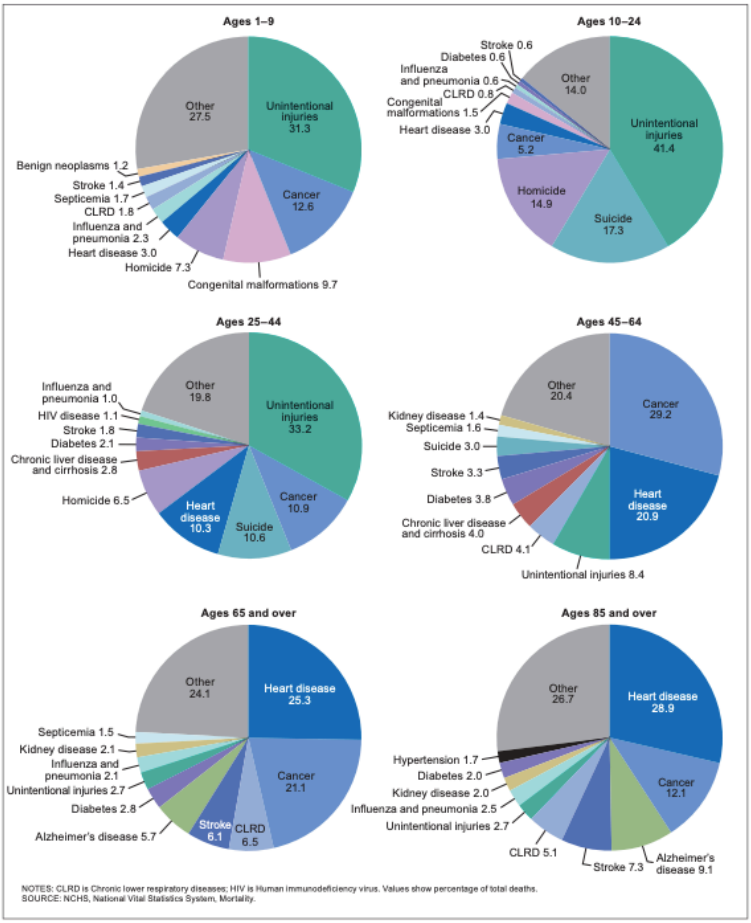

***Figure 2**. Percent distribution of the 10 leading causes of death, by age group: United States, 2016.*

Notice that unintentional injuries are the leading cause of death for the widest variety of ages, and recall from the previous section above that accidents were also found to have become increasingly common as causes of death within the United States population between 2000 and 2016. These were the top causes of death for various age groups in the United States in the year 2016:

- < 1 year – Congenital anomalies
- 1 – 4 years – Unintentional Injury
- 5 – 9 years – Unintentional Injury
- 10 – 14 years – Unintentional Injury
- 15 – 24 years – Unintentional Injury
- 25 – 34 years – Unintentional Injury
- 35 – 44 years – Unintentional Injury
- 45 – 54 years – Malignant Neoplasms (cancer)
- 55 – 64 years – Malignant Neoplasms (cancer)
- 65 + – Heart Disease

The causes of death on this list resemble the causes presented in the previous sections, but the breakdown of these causes by age group highlights the true prevalence of each. Unintentional injury (accidents), for example, was found to be the third most common cause of death within the United States population, but it becomes apparent from this list that it is the most common for the widest range of age groups or developmental stages. Heart disease was found to ~~the~~ be the most common cause of death overall, but this list shows that it is more restricted to one age group (65+) than other causes. Similarly, cancer was found to be the second most common cause of death within the United States population, but this list reveals that it is most prevalent for individuals in middle to late adulthood.

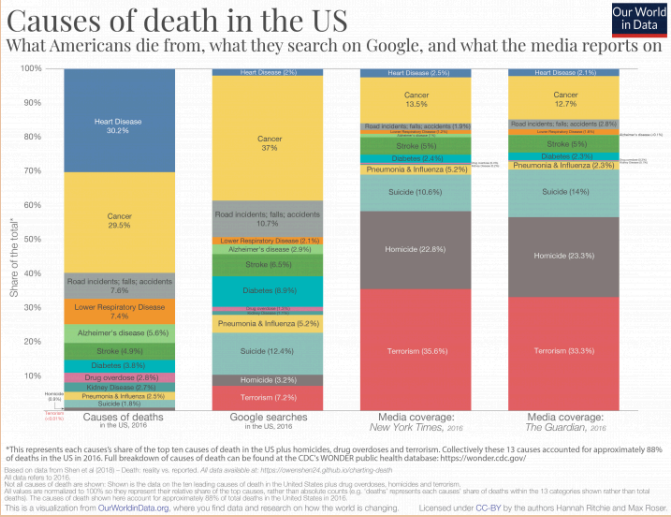

***Figure 3**. Actual causes of death compared with media coverage of death.*

Interestingly, the things that actually result in death are not often the things we hear about on the news. Because of the availability heuristic—a cognitive shortcut in which people rely heavily on information that is most readily available in their mind, people may erroneously be more afraid of sensational deaths than death by more normal causes, such as heart disease.

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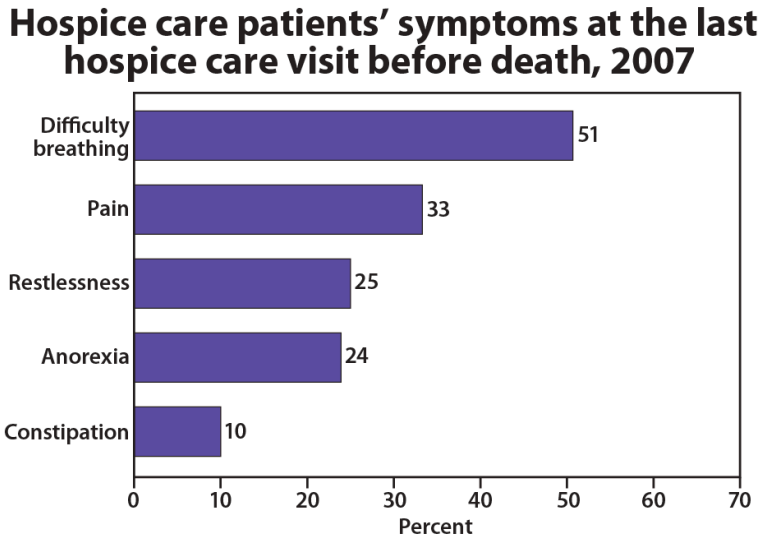
The Process of Dying

Aspects of Death

One way to understand death and dying is to look more closely at physiological death, social death, and psychological death. These deaths do not occur simultaneously, nor do they always occur in a set order. Rather, a person's physiological, social, and psychological deaths can occur at different times.

Functional or **Physiological death** occurs when the vital organs no longer function. The digestive and respiratory systems begin to shut down during the gradual process of dying. A dying person no longer wants to eat as digestion slows, the digestive track loses moisture, and chewing, swallowing, and elimination become painful processes. Circulation slows and mottling, or the pooling of blood, may be noticeable on the underside of the body, appearing much like bruising. Breathing becomes more sporadic and shallow and may make a rattling sound as air travels through mucus-filled passageways. **Agonal breathing** refers to gasping, labored breaths caused by an abnormal pattern of brainstem reflex. The person often sleeps more and more and may talk less, although they may continue to hear. The kinds of symptoms noted prior to death in patients under hospice care (care focused on helping patients die as comfortably as possible) are noted below.



SOURCE: CDC/NCHS, *Health, United States, 2010*, Figure 40. Data from the National Home and Hospice Care Survey.

Figure 4. *These are common symptoms reported prior, but close to, death.*

When a person is **brain dead**, or no longer has brain activity, they are clinically dead. Physiological death may take 72 or fewer hours. This is different than a **vegetative state**, which occurs when the cerebral cortex no longer registers electrical activity but the brain stems continues to be active. Individuals who are kept alive through life support may be classified this way.

Watch it

This video explains the difference between a vegetative state, a coma, and being brain dead.

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Social death begins much earlier than physiological death. Social death occurs when others begin to withdraw from someone who is terminally ill or has been diagnosed with a terminal illness. Those diagnosed with conditions such as AIDS or cancer may find that friends, family members, and even health care professionals begin to say less and visit less frequently. Meaningful discussions may be replaced with comments about the weather or other topics of light conversation. Doctors may spend less time with patients after their prognosis becomes poor. Why do others begin to withdraw? Friends and family members may feel that they do not know what to say or that they can offer no solutions to relieve suffering. They withdraw to protect themselves against feeling inadequate or from having to face the reality of death. Health professionals, trained to heal, may also feel inadequate and uncomfortable facing decline and death. A patient who is dying may be referred to as "circling the drain," meaning that they are approaching death. People in nursing homes may live as socially dead for years with no one visiting or calling. Social support is important for quality of life and those who experience social death are deprived from the benefits that come from loving interaction with others.

Psychological death occurs when the dying person begins to accept death and to withdraw from others and regress into the

self. This can take place long before physiological death (or even social death if others are still supporting and visiting the dying person) and can even bring physiological death closer. People have some control over the timing of their death and can hold on until after important occasions or die quickly after having lost someone important to them. In some cases, individuals can give up their will to live. This is often at least partially attributable to a lost sense of identity. The individual feels consumed by the reality of making final decisions, planning for loved ones—especially children, and coping with the process of his or her own physical death.

Interventions based on the idea of self-empowerment enable patients and families to identify and ultimately achieve their own goals of care, thus producing a sense of empowerment. Self-empowerment for terminally ill individuals has been associated with a perceived ability to manage and control things such as medical actions, changing life roles, and psychological impacts of the illness.

Treatment plans that are able to incorporate a sense of control and autonomy into the dying individual's daily life have been found to be particularly effective in regards to general attitude as well as depression level. For example, it has been found that when dying individuals are encouraged to recall situations from their lives in which they were active decision makers, explored various options, and took action, they tend to have better mental health than those who focus on themselves as victims. Similarly, there are several theories of coping that suggest **active coping** (seeking information, working to solve problems) produces more positive outcomes than **passive coping** (characterized by avoidance and distraction). Although each situation is unique and depends at least partially on the individual's developmental stage, the general consensus is that it is important for caregivers to foster a supportive environment and partnership with the dying individual, which promotes a sense of independence, control, and self-respect.

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Emotions Related to Death

While death is inevitable, our emotional responses and reactions to it vary dramatically. In this section, we'll take a closer look at the emotions that are involved in death, both for the individual who is dying as well as their family and friends. We'll also learn more about the stages of grief and how to cope with death.

Bereavement refers to outward expressions of grief. Mourning and funeral rites are expressions of loss that reflect personal and cultural beliefs about the meaning of death and the afterlife. When asked what type of funeral they would like to have, students responded in a variety of ways; each expressing both their personal beliefs and values and those of their culture.

> *I would like the service to be at a Baptist church, preferably my Uncle Ike's small church. The service should be a celebration of life . . .I would like there to be hymns sung by my family members, including my favorite one, "It is Well With my Soul". . .At the end, I would like the message of salvation to be given to the attendees and an alter call for anyone who would like to give their life to Christ. . .*
>
> *I want a very inexpensive funeral-the bare minimum, only one vase of flowers, no viewing of the remains and no long period of mourning from my remaining family . . . funeral expenses are extremely overpriced and out of hand. . .*
>
> *When I die, I would want my family members, friends, and other relatives to dress my body as it is usually done in my country, Ghana. Lay my dressed body in an open space in my*

house at the night prior to the funeral ceremony for my loved ones to walk around my body and mourn for me. . .

I would like to be buried right away after I die because I don't want my family and friends to see my dead body and to be scared.

In my family we have always had the traditional ceremony-coffin, grave, tombstone, etc. But I have considered cremation and still ponder which method is more favorable. Unlike cremation, when you are 'buried' somewhere and family members have to make a special trip to visit, cremation is a little more personal because you can still be in the home with your loved ones . . .

I would like to have some of my favorite songs played . . .I will have a list made ahead of time. I want a peaceful and joyful ceremony and I want my family and close friends to gather to support one another. At the end of the celebration, I want everyone to go to the Thirsty Whale for a beer and Spang's for pizza!

When I die, I want to be cremated . . . I want it the way we do it in our culture. I want to have a three day funeral and on the 4th day, it would be my burial/cremation day . . .I want everyone to wear white instead of black, which means they already let go of me. I also want to have a mass on my cremation day.

When I die, I would like to have a befitting burial ceremony as it is done in my Igbo customs. I chose this kind of funeral ceremony because that is what every average person wishes to have.

I want to be cremated . . . I want all attendees wearing their favorite color and I would like the song "Riders on the Storm" to be played . . .I truly hope all the attendees will appreciate the bass. At the end of this simple, short service, attendees will be given multi-colored helium filled balloons . . . released to signify my release from this earth. . .They will be invited back to the house for ice cream cones, cheese popcorn and a wide variety of other treats and much, much, much rock music . . .

I want to be cremated when I die. To me, it's not just my culture to do so but it's more peaceful to put my remains or ashes to the world. Let it free and not stuck in a casket.

These statements reflect a wide variety of conceptions and attitudes toward death. Culture plays a key role in the development of these conceptions and attitudes, and it also provides a framework within which they are expressed. However, it is important to note that culture does not provide set rules for how death is viewed and experienced, and there tends to be as much variation within cultures as well as between.

Watch IT

What happens after death? This question has plagued humans since the beginning, and there are countless numbers of philosophies and religions that attempt to explain the next life (if there is one). Some, like Buddhism, Jainism, Hinduism, and Sikhism, support the idea of reincarnation, or the idea that a living being starts a new life in a different physical body or form after each biological death. Some belief systems, such as those in the Abrahamic tradition (Christians, Jews, and Muslims), hold that the dead go to a specific plane of existence after death, as determined by God, or other divine judgment, based on their actions or beliefs during life.

The following video presents philosophical views of death from well-known figures throughout history, including Socrates and Epicurus.

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You can watch this video, "Social Attitudes Toward Death" to learn more about various perspectives on death.

***Figure 1**. Ceremonies, such as this burial service, are customary in nearly every culture to celebrate or honor those who have passed.*

Another important consideration related to conceptions and attitudes toward death involves social attitudes. Death, in many cases, can be the "elephant in the room," a concept that remains ever present but continues to be taboo for most individuals. Talking openly about death tends to be viewed negatively, or even as socially inappropriate. Specific social norms and standards regarding death vary between groups, but on a larger societal level, death is usually a topic reserved only for when it becomes absolutely necessary to bring up.

Regardless of variations in conceptions and attitudes toward death, ceremonies provide survivors a sense of closure after a loss. These rites and ceremonies send the message that the death is real and allow friends and loved ones to express their love and duty to those who die. Under circumstances in which a person has

been lost and presumed dead or when family members were unable to attend a funeral, there can continue to be a lack of closure that makes it difficult to grieve and to learn to live with loss. And although many people are still in shock when they attend funerals, the ceremony still provides a marker of the beginning of a new period of one's life as a survivor.

The Body After Death

In most cultures, after the last offices have been performed and before the onset of significant decay, relations or friends arrange for ritual disposition of the body, either by destruction, or by preservation, or in a secondary use. In the U.S., this frequently means either cremation or interment in a tomb.

There are various methods of destroying human remains, depending on religious or spiritual beliefs, and upon practical necessity. Cremation is a very old and quite common custom. For some people, the act of cremation exemplifies the belief of the Christian concept of "ashes to ashes". On the other hand, in India, cremation and disposal of the bones in the sacred river Ganges is common. Another method is sky burial, which involves placing the body of the deceased on high ground (a mountain) and leaving it for birds of prey to dispose of, as in Tibet. In some religious views, birds of prey are carriers of the soul to the heavens. Such practice may also have originated from pragmatic environmental issues, such as conditions in which the terrain (as in Tibet) is too stony or hard to dig, or in which there are few trees around to burn. As the local religion of Buddhism, in the case of Tibet, believes that the body

after death is only an empty shell, there are more practical ways than burial of disposing of a body, such as leaving it for animals to consume. In some fishing or marine communities, mourners may put the body into the water, in what is known as burial at sea. Several mountain villages have a tradition of hanging the coffin in woods.

Since ancient times, in some cultures efforts have been made to slow, or largely stop the body's decay processes before burial, as in mummification or embalming. This process may be done before, during or after a funeral a ceremony. The Toraja people of Indonesia are known to mummify their deceased loved ones and keep them in their homes for weeks, months, and sometimes even years, before holding a funeral service. Read more about that in this Post Magazine article "Living with Corpses: How Indonesian's Toraja People Deal with Their Dead."

Watch this TED talk, "The Corpses that Changed my Life" by Caitlin Doughty, a mortician and activist, who strives to encourage Americans to overcome their phobia of death and to be more open and involved in dealing with their deceased loved ones.

Developmental Perspectives on Death

Another key factor in individuals' attitudes towards death and dying is where they are in their own lifespan development. First of all, individuals' attitudes are linked to their cognitive ability to understand death and dying. Infants and toddlers cannot understand death. They function in the present and are aware of loss and separation, as well as disruptions in their routines. They

are also attuned to the emotions and behaviors of significant adults in their lives, so a death of a loved one may cause a young child to become anxious and irritable, cry, or change their sleeping and eating habits.

A preschooler may approach death by asking when a deceased person is coming back and might search for them, thinking that death is temporary and reversible. They may experience brief but intense reactions, such as tantrums, or other behaviors like frightening dreams and disrupted sleep, bedwetting, clinging, and thumbsucking. Similarly, those in early childhood (age 4-7), might also ask where the deceased person is and search for them, as well as regress to younger behaviors. They might also think that the person's death is their own fault, as per their belief in the power of their own thoughts and "magical thinking." Their grief might be expressed through play, rather than verbally.

Those in middle childhood (ages 7-10) begin to see death as final, not reversible, and universal. Developing Piaget's concrete operational thinking, they may engage in personification, seeing death as a human figure who carried their loved one away. They may not really believe that death could happen to them or their family, maybe only to the very old or sick—they may also view death as a punishment. They might act out in school or they might try to keep a bond with the deceased by taking on that person's role or behaviors.

Preadolescents (ages 10-12) try to understand both biological and emotional processes of death. But they try to hide their feelings and not seem different from their peers; they may seem indifferent, or they may have outbursts. As Amsler (2015) noted, children's and teens' experiences with death and what adults tell them about death will also influence their comprehension. As teens develop formal operational thinking (ages 12-18), they can apply logic to abstractions; they spend more time pondering the meaning of life and death and what comes after death. Their understanding of death becomes more complex as they move from a binary logical concept (alive or dead) to a fuzzy logical concept with potential

life after death, for instance. Adolescents are also tasked with integrating these beliefs into their own identity development.

What about attitudes toward death in adulthood? We've learned about adults becoming more concerned with their own mortality during middle adulthood, particularly as they experience the deaths of their own parents. Recently, (Sinoff, 2017) research on thanatophobia, or death anxiety, found differences in death anxiety between elderly patients and their adult children. Death anxiety may entail two different parts—being anxious about death and being anxious about the process of dying. The elderly were only anxious about the process of dying (i.e., suffering), but their adult children were very anxious about death itself and mistakenly believed that their parents were also anxious about death itself. This is an important distinction and can make a significant difference in how medical information and end-of-life decisions are communicated within families. Consistent with this, if elders resolve Erikson's final psychosocial crisis, ego integrity versus despair, in a positive way, they may not fear death, but gain the virtue of wisdom. If they are not feeling desperate ("despair" with time running out), then they may not be anxious or fearful about death.

Bereavement and Grief

Grief is the psychological, physical, and emotional experience and reaction to loss. People may experience grief in various ways, but several theories, such as Kübler-Ross' stages of loss theory, attempt to explain and understand the way people deal with grief. Kübler-Ross' famous theory, which we'll examine in more detail soon, describes five stages of grief: denial, anger, bargaining, depression, and acceptance.

Grief reactions vary depending on whether a loss was anticipated or unexpected, (parents do not expect to lose their children, for example), and whether or not it occurred suddenly or after a long

illness, and whether or not the survivor feels responsible for the death. Struggling with the question of responsibility is particularly felt by those who lose a loved one to suicide. These survivors may torment themselves with endless "what ifs" in order to make sense of the loss and reduce feelings of guilt. And family members may also hold one another responsible for the loss. The same may be true for any sudden or unexpected death, making conflict an added dimension to grief. Much of this laying of responsibility is an effort to think that we have some control over these losses; the assumption being that if we do not repeat the same mistakes, we can control what happens in our life. While grief describes the response to loss, **bereavement** describes the state of being following the death of someone.

As we've already learned in terms of attitudes toward death, individuals' own lifespan developmental stage and cognitive level can influence their emotional and behavioral reactions to the death of someone they know. But what about the impact of the type of death or age of the deceased or relationship to the deceased upon bereavement?

Death of a child

Death of a child can take the form of a loss in infancy such as miscarriage or stillbirth or neonatal death, SIDS, or the death of an older child. In most cases, parents find the grief almost unbearably devastating, and it tends to hold greater risk factors than any other loss. This loss also bears a lifelong process: one does not get 'over' the death but instead must assimilate and live with it. Intervention and comforting support can make all the difference to the survival of a parent in this type of grief but the risk factors are great and may include family breakup or suicide. Feelings of guilt, whether legitimate or not, are pervasive, and the dependent nature of the relationship disposes parents to a variety of problems as they seek

to cope with this great loss. Parents who suffer miscarriage or a regretful or coerced abortion may experience resentment towards others who experience successful pregnancies.

Suicide

Suicide rates are growing worldwide and over the last thirty years there has been international research trying to curb this phenomenon and gather knowledge about who is "at-risk". When a parent loses their child through suicide it is traumatic, sudden, and affects all loved ones impacted by this child. Suicide leaves many unanswered questions and leaves most parents feeling hurt, angry and deeply saddened by such a loss. Parents may feel they can't openly discuss their grief and feel their emotions because of how their child died and how the people around them may perceive the situation. Parents, family members and service providers have all confirmed the unique nature of suicide-related bereavement following the loss of a child. They report a wall of silence that goes up around them and how people interact towards them. One of the best ways to grieve and move on from this type of loss is to find ways to keep that child as an active part of their lives. It might be privately at first but as parents move away from the silence they can move into a more proactive healing time.

Death of a spouse

The death of a spouse is usually a particularly powerful loss. A spouse often becomes part of the other in a unique way: many widows and widowers describe losing 'half' of themselves. The days, months and years after the loss of a spouse will never be the same and learning to live without them may be harder than one would expect. The grief experience is unique to each person. Sharing and

building a life with another human being, then learning to live singularly, can be an adjustment that is more complex than a person could ever expect. Depression and loneliness are very common. Feeling bitter and resentful are normal feelings for the spouse who is "left behind". Oftentimes, the widow/widower may feel it necessary to seek professional help in dealing with their new life.

After a long marriage, at older ages, the elderly may find it a very difficult assimilation to begin anew; but at younger ages as well, a marriage relationship was often a profound one for the survivor.

Furthermore, most couples have a division of 'tasks' or 'labor', e.g., the husband mows the yard, the wife pays the bills, etc. which, in addition to dealing with great grief and life changes, means added responsibilities for the bereaved. Immediately after the death of a spouse, there are tasks that must be completed. Planning and financing a funeral can be very difficult if pre-planning was not completed. Changes in insurance, bank accounts, claiming of life insurance, securing childcare are just some of the issues that can be intimidating to someone who is grieving. Social isolation may also become imminent, as many groups composed of couples find it difficult to adjust to the new identity of the bereaved, and the bereaved themselves have great challenges in reconnecting with others. Widows of many cultures, for instance, wear black for the rest of their lives to signify the loss of their spouse and their grief. Only in more recent decades has this tradition been reduced to shorter periods of time.

Death of a parent

For a child, the death of a parent, without support to manage the effects of the grief, may result in long-term psychological harm. This is more likely if the adult carers are struggling with their own grief and are psychologically unavailable to the child. There is a critical role of the surviving parent or caregiver in helping the

children adapt to a parent's death. Studies have shown that losing a parent at a young age did not just lead to negative outcomes; there are some positive effects. Some children had an increased maturity, better coping skills and improved communication. Adolescents valued other people more than those who have not experienced such a close loss.

When an adult child loses a parent in later adulthood, it is considered to be "timely" and to be a normative life course event. This allows the adult children to feel a permitted level of grief. However, research shows that the death of a parent in an adult's midlife is not a normative event by any measure, but is a major life transition causing an evaluation of one's own life or mortality. Others may shut out friends and family in processing the loss of someone with whom they have had the longest relationship.

Death of a sibling

The loss of a sibling can be a devastating life event. Despite this, sibling grief is often the most disenfranchised or overlooked of the four main forms of grief, especially with regard to adult siblings. Grieving siblings are often referred to as the 'forgotten mourners' who are made to feel as if their grief is not as severe as their parents grief (N.a., 2015). However, the sibling relationship tends to be the longest significant relationship of the lifespan and siblings who have been part of each other's lives since birth, such as twins, help form and sustain each other's identities; with the death of one sibling comes the loss of that part of the survivor's identity because "your identity is based on having them there."

The sibling relationship is a unique one, as they share a special bond and a common history from birth, have a certain role and place in the family, often complement each other, and share genetic traits. Siblings who enjoy a close relationship participate in each other's daily lives and special events, confide in each other, share joys,

spend leisure time together (whether they are children or adults), and have a relationship that not only exists in the present but often looks toward a future together (even into retirement). Surviving siblings lose this "companionship and a future" with their deceased siblings.

When a parent or caregiver dies or leaves, children may have symptoms of psychopathology, but they are less severe than in children with major depression. The loss of a parent, grandparent or sibling can be very troubling in childhood, but even in childhood there are age differences in relation to the loss. A very young child, under one or two, may be found to have no reaction if a carer dies, but other children may be affected by the loss.

At a time when trust and dependency are formed, a break even of no more than separation can cause problems in well-being; this is especially true if the loss is around critical periods such as 8–12 months, when attachment and separation are at their height information, and even a brief separation from a parent or other person who cares for the child can cause distress.

Even as a child grows older, death is still difficult to fathom and this affects how a child responds. For example, younger children see death more as a separation, and may believe death is curable or temporary. Reactions can manifest themselves in "acting out" behaviors: a return to earlier behaviors such as sucking thumbs, clinging to a toy or angry behavior; though they do not have the maturity to mourn as an adult, they feel the same intensity. As children enter pre-teen and teen years, there is a more mature understanding.

Children can experience grief as a result of losses due to causes other than death. For example, children who have been physically, psychologically or sexually abused often grieve over the damage to or the loss of their ability to trust. Since such children usually have no support or acknowledgement from any source outside the family unit, this is likely to be experienced as disenfranchised grief.

Relocations can also cause children significant grief particularly if they are combined with other difficult circumstances such as

neglectful or abusive parental behaviors, other significant losses, etc.

Loss of a friend or classmate

Children may experience the death of a friend or a classmate through illness, accidents, suicide, or violence. Initial support involves reassuring children that their emotional and physical feelings are normal. Schools are advised to plan for these possibilities in advance.

Survivor guilt (or survivor's guilt; also called survivor syndrome or survivor's syndrome) is a mental condition that occurs when a person perceives themselves to have done wrong by surviving a traumatic event when others did not. It may be found among survivors of combat, natural disasters, epidemics, among the friends and family of those who have died by suicide, and in non-mortal situations such as among those whose colleagues are laid off.

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Anticipatory grief occurs when a death is expected and survivors have time to prepare to some extent before the loss. Anticipatory grief can include the same denial, anger, bargaining, depression, and acceptance experienced in loss one might experience after a death; this can make adjustment after a loss somewhat easier, although a person may then go through the stages of loss again after the death. A death after a long-term, painful illness may bring family members a sense of relief that the suffering is over or the exhausting process of caring for someone who is ill is over.

Complicated grief involves a distinct set of maladaptive or self-defeating thoughts, emotions, and behaviors that occur as a negative response to a loss. From a cognitive and emotional perspective, these individuals tend to experience extreme bitterness over the loss, intense preoccupation with the deceased, and a need to feel connected to the deceased. These feelings often lead the grieving individual to engage in problematic behaviors that further prevent positive coping and delay the return to normalcy. He or she may spend excessive amounts of time visiting the deceased person's grave, talking to the deceased person, or trying to connect with the deceased person on a spiritual level, often forgoing other responsibilities or tasks to do so. The extreme nature of these thoughts, emotions, and behaviors separate this type of grief from the normal grieving process.

Disenfranchised grief may be experienced by those who have

to hide the circumstances of their loss or whose grief goes unrecognized by others. Loss of an ex-spouse, lover, or pet may be examples of disenfranchised grief.

It has been said that intense grief lasts about two years or less, but grief is felt throughout life. One loss triggers the feelings that surround another. People grieve with varied intensity throughout the remainder of their lives. It does not end. But it eventually becomes something that a person has learned to live with. As long as we experience loss, we experience grief.

There are layers of grief. Initial denial, marked by shock and disbelief in the weeks following a loss may become an expectation that the loved one will walk in the door. And anger directed toward those who could not save our loved one's life, may become anger that life did not turn out as we expected. There is no right way to grieve. A bereavement counselor expressed it well by saying that grief touches us on the shoulder from time to time throughout life.

Grief and mixed emotions go hand in hand. A sense of relief is accompanied by regrets and periods of reminiscing about our loved ones are interspersed with feeling haunted by them in death. Our outward expressions of loss are also sometimes contradictory. We want to move on but at the same time are saddened by going through a loved one's possessions and giving them away. We may no longer feel sexual arousal or we may want sex to feel connected and alive. We need others to befriend us but may get angry at their attempts to console us. These contradictions are normal and we need to allow ourselves and others to grieve in their own time and in their own ways.

The "death-denying, grief-dismissing world" is often the approach to grief in our modern world. We are asked to grieve privately, quickly, and to medicate our suffering. Employers grant us 3 to 5 days for bereavement, if our loss is that of an immediate family member. And such leaves are sometimes limited to no more than one per year. Yet grief takes much longer and the bereaved are seldom ready to perform well on the job. It becomes a clash between life having to continue, and the individual being ready for it to do

so. One coping mechanism that can help smooth out this conflict is called the **fading affect bias**. Based on a collection of similar findings, the fading affect bias suggests that negative events, such as the death of a loved one, tend to lose their emotional intensity at a faster rate than pleasant events. This is believed to help enhance pleasant experiences and avoid the negative emotions associated with unpleasant ones, thus helping the individual return to his or her normal daily routines following a loss.

Link to Learning

Sociologist Nancy Berns explains that in the United States and other western societies, people are encouraged to deal with grief or loss through closure. She contradicts this advice and explains that people do not necessarily need closure in order to "move on." Watch Nancy Berns' TED talk "Beyond Closure" to learn more.

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Stages of Loss

The complex construct of death is associated with a variety of thoughts, emotions, and behaviors, that vary between individuals and groups. To some, death is the final end, when the body ceases to function, with nothing occurring next. To others, death is the start of a new journey, and is its own beginning. These varying viewpoints are shaped by numerous factors related to culture, religion, social norms, personal experiences, and more. It is no surprise then that

multiple theories have been created to understand the occurrence of death on cognitive, emotional, and behavioral levels; each offering different explanations for what individuals go through during death.

Kübler-Ross' Stages of Loss

Kübler-Ross (1965) described five stages of loss experienced by someone who faces the news of their impending death (based on her work and interviews with terminally ill patients). These "stages" are not really stages that a person goes through in order or only once; nor are they stages that occur with the same intensity. Indeed, the process of death is influenced by a person's life experiences, the timing of their death in relation to life events, the predictability of their death based on health or illness, their belief system, and their assessment of the quality of their own life. Nevertheless, these stages provide a framework to help us to understand and recognize some of what a dying person experiences psychologically. And by understanding, we are more equipped to support that person as they die.

> **Denial** is often the first reaction to overwhelming, unimaginable news. Denial, or disbelief or shock, protects us by allowing such news to enter slowly and to give us time to come to grips with what is taking place. The person who receives positive test results for life-threatening conditions may question the results, seek second opinions, or may simply feel a sense of disbelief psychologically even though they know that the results are true.
>
> **Anger** also provides us with protection in that being angry energizes us to fight against something and gives structure to a situation that may be thrusting us into the unknown. It is much easier to be angry than to be sad or in pain or depressed. It helps us to temporarily believe that we have a

sense of control over our future and to feel that we have at least expressed our rage about how unfair life can be. Anger can be focused on a person, a health care provider, at God, or at the world in general. And it can be expressed over issues that have nothing to do with our death; consequently, being in this stage of loss is not always obvious.

Bargaining involves trying to think of what could be done to turn the situation around. Living better, devoting self to a cause, being a better friend, parent, or spouse, are all agreements one might willingly commit to if doing so would lengthen life. Asking to just live long enough to witness a family event or finish a task are examples of bargaining.

Depression is sadness and sadness is appropriate for such an event. Feeling the full weight of loss, crying, and losing interest in the outside world is an important part of the process of dying. This depression makes others feel very uncomfortable and family members may try to console their loved one. Sometimes hospice care may include the use of antidepressants to reduce depression during this stage.

Acceptance involves learning how to carry on and to incorporate this aspect of the life span into daily existence. Reaching acceptance does not in any way imply that people who are dying are happy about it or content with it. It means that they are facing it and continuing to make arrangements and to say what they wish to say to others. Some terminally ill people find that they live life more fully than ever before after they come to this stage.

In some ways, these five stages serve as cognitive defense mechanisms, allowing the individual to make sense of the situation while coming to terms with what is happening. They are, in other words, the mind's way of gradually recognizing the implications of one's impending death and giving him or her the chance to process it. These stages provide a type of framework in which dying is experienced, although it is not exactly the same for every individual in every case.

Since Kübler-Ross presented these stages of loss, several other models have been developed. These subsequent models, in many ways, build on that of Kübler-Ross, offering expanded views of how individuals process loss and grief. While Kübler-Ross' model was restricted to dying individuals, subsequent theories tended to focus on loss as a more general construct. This ultimately suggests that facing one's own death is just one example of the grief and loss that human beings can experience, and that other loss or grief-related situations tend to be processed in a similar way.

Watch it

Watch the first six minutes of this video to learn more about how the Kübler-Ross model evolved since its inception. The latter half of the video focuses on several other models that focus on how people can deal with the loss of loved one, or with grief in general. While the Kübler-Ross model remains important and useful today, it is does not fit everyone's experience with grief, and research continues today to understand how people cope with grief.

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Other Models on Grief

One such model was presented by Worden (1991), which explained the process of grief through a set of four different tasks that the individual must complete in order to resolve the grief. These tasks included: (a) accepting that the loss has occurred, (b) working through and experiencing the pain associated with grief, (c) adjusting the the changes that the loss created in the environment, and (d) moving past the loss on an emotional level.

Another model is that of Parkes (1998), which broke down grief into four stages, including: (a) shock, (b) yearning, (c) despair, and (d) recovery. Although comprised of somewhat different stages than those of Kübler-Ross' model, Parkes' stages still reflected an ongoing process that the individual goes through, each of which was characterized by different thoughts, emotions, and behaviors.

Throughout this process, the individual gradually moves closer to accepting the situation, and being able to continue with his or her daily life to the greatest extent possible.

A different approach was proposed by Strobe and Shut (1999), which suggested that individuals cope with grief through an ongoing set of processes related to both loss and restoration. The loss-oriented processes included: (a) grief work, (b) intrusion on grief, (c) denying or avoiding changes toward restoration, and (d) the breaking of bonds or ties. The restoration-oriented processes included: (a) attending to life changes, (b) distracting oneself from grief, (c) doing new things, and (d) establishing new roles, identities, and relationships. Since each individual experiences grief and loss differently, in light of personal, cultural, and environmental factors, these processes often occur simultaneously, and not in a set order.

Link to Learning

Visit "Grief Reactions Over the Life Span" from the American Counseling Association to consider how various age groups deal with the death of a loved one.

We no longer think that there is a "right way" to experience grief and loss. People move through a variety of stages with different frequency and in different ways. The theories that have been developed to help explain and understand this complex process have shifted over time to encompass a wider variety of situations, as well as to present implications for helping and supporting the individual(s) who are going through it. The following strategies have been identified as effective in the support of healthy grieving:

- **Talk about the death.** This will help the surviving individuals

understand what happened and remember the deceased in a positive way. When coping with death, it can be easy to get wrapped up in denial, which can lead to isolation and lack of a solid support system.

- **Accept the multitude of feelings.** The death of a loved one can, and almost always does, trigger numerous emotions. It is normal for sadness, frustration, and in some cases exhaustion to be experienced.
- **Take care of yourself and your family.** Remembering to keep one's own health and the health of their family a priority can help with moving through each day effectively. Making an conscious effort to eat well, exercise regularly, and obtain adequate rest is important.
- **Reach out and help others dealing with the loss.** It has long been recognized that helping others can enhance one's own mood and general mental state. Helping others as they cope with the loss can have this effect, as can sharing stories of the deceased.
- **Remember and celebrate the lives of your loved ones.** This can be a great way to honor the relationship that was once had with the deceased. Possibilities can include donating to a charity that the deceased supported, framing photos of fun experiences with the deceased, planting a tree or garden in memory of the deceased, or anything else that feels right for the particular situation.

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Facing Death

In this section, we'll turn our attention from the process of dying to the actual death of the individual. We'll examine various ways in which deliberate death can occur, along with the supportive practices that are available for those who are dying. We will also take a closer look at the cultural and legal implications of end-of-life practices.

Palliative Care and Hospice

Palliative care is an interdisciplinary approach to specialized medical and nursing care for people with life-limiting illnesses. It focuses on providing relief from the symptoms, pain, physical stress, and mental stress at any stage of illness, with a goal of improving the quality of life for both the person and their family. Doctors who specialize in palliative care have had training tailored to helping patients and their family members cope with the reality of the impending death and make plans for what will happen after.

Palliative care is provided by a team of physicians, nurses, physiotherapists, occupational therapists, speech-language pathologists, and other health professionals who work together with the primary care physician and referred specialists or other hospital or hospice staff to provide additional support to the patient. It is appropriate at any age and at any stage in a serious illness and can be provided as the main goal of care or along with curative treatment. Although it is an important part of end-of-life

care, it is not limited to that stage. Palliative care can be provided across multiple settings including in hospitals, at home, as part of community palliative care programs, and in skilled nursing facilities. Interdisciplinary palliative care teams work with people and their families to clarify goals of care and provide symptom management, psychosocial, and spiritual support.

Hospice

In many other countries, no distinction is made between palliative care and hospice, but in the United States, the terms have different meanings and usages. They both share similar goals of providing symptom relief and pain management, but **hospice care** is a type of care involving palliation without curative intent. Usually, it is used for people with no further options for curing their disease or for people who have decided not to pursue further options that are arduous, likely to cause more symptoms, and not likely to succeed. The biggest difference between hospice and palliative care is the type of illness people have, where they are in their illness especially related to prognosis, and their goals/wishes regarding curative treatment. Hospice care under the Medicare Hospice Benefit requires that two physicians certify that a person has less than six months to live if the disease follows its usual course. This does not mean, though, that if a person is still living after six months in hospice he or she will be discharged from the service.

Watch It

Watch this video to better understand the setting, circumstances, and services associated with hospice care.

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Hospice care involves caring for dying patients by helping them be as free from pain as possible, providing them with assistance to complete wills and other arrangements for their survivors, giving them social support through the psychological stages of loss, and helping family members cope with the dying process, grief, and bereavement. It focuses on five topics: communication, collaboration, compassionate caring, comfort, and cultural (spiritual) care. Most hospice care does not include medical treatment of disease or resuscitation although some programs administer curative care as well. The patient is allowed to go through the dying process without invasive treatments. Family members who have agreed to put their loved one on hospice may become anxious when the patient begins to experience death. They may believe that feeding or breathing tubes will sustain life and want to change their decision. Hospice workers try to inform the family of what to expect and reassure them that much of what they see is a normal part of the dying process.

Watch It

One aspect of palliative and hospice care is helping dying individuals and their families understand what is happening, and what it may imply for their lives. The

following video provides an example of palliative care in a hospital setting.

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The History of Hospice

Dame Cicely Saunders was a British registered nurse whose chronic health problems had forced her to pursue a career in medical social work. The relationship she developed with a dying Polish refugee helped solidify her ideas that terminally ill patients needed compassionate care to help address their fears and concerns as well as palliative comfort for physical symptoms. After the refugee's death, Saunders began volunteering at St Luke's Home for the Dying Poor, where a physician told her that she could best influence the treatment of the terminally ill as a physician. Saunders entered medical school while continuing her volunteer work at St. Joseph's. When she achieved her degree in 1957, she took a position there.

Saunders emphasized focusing on the patient rather than the disease and introduced the notion of 'total pain', which included psychological, spiritual, emotional, intellectual, and interpersonal aspects of pain, the physical aspects, and even financial and bureaucratic aspects. This focus on the broad effects of death on

dying individuals and their families has provided the foundation for modern-day practices related to hospice care services.

Saunders disseminated her philosophy internationally in a series of tours of the United States that began in 1963. In 1967, Saunders opened St. Christopher's Hospice. Florence Wald, the Dean of Yale School of Nursing who had heard Saunders speak in America, spent a month working with Saunders there in 1969 before bringing the principles of modern hospice care back to the United States, establishing Hospice, Inc. in 1971. Another early hospice program in the United States, Alive Hospice, was founded in Nashville, Tennessee on November 14, 1975. By 1977 the National Hospice Organization had been formed.

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Hospice Care in Practice

The early established hospices were independently operated and dedicated to giving patients as much control over their own death process as possible. Today, it is estimated that over 40 million individuals require palliative care, with over 78% of them being of low-income status or living in low-income countries. It is also estimated, however, that less than 14% of these individuals receive it. This gap is created by restrictive regulatory laws regarding controlled substance medications for pain management, as well as a general lack of adequate training in regards to palliative care within the health professional community. Although hospice care has become more widespread, these new programs are subjected to more rigorous insurance guidelines that dictate the types and amounts of medications used, length of stay, and types of patients who are eligible to receive hospice care. Thus, more patients are being served, but providers have less control over the services they provide, and lengths of stay are more limited. Patients receive palliative care in hospitals and in their homes.

The majority of patients on hospice are cancer patients and they typically do not enter hospice until the last few weeks prior to death. The average length of stay is less than 30 days and many patients are on hospice for less than a week. Medications are rubbed into the skin or given in drop form under the tongue to relieve the discomfort of swallowing pills or receiving injections. A hospice care team includes a chaplain as well as nurses and grief counselors to assist spiritual needs in addition to physical ones. When hospice is administered at home, family members may also be part, and sometimes the biggest part, of the care team. Certainly, being in familiar surroundings is preferable to dying in an unfamiliar place. But about 60 to 70 percent of people die in hospitals and another 16 percent die in institutions such as nursing homes. Most hospice programs serve people over 65; few programs are available for terminally ill children.

Hospice care focuses on alleviating physical pain and providing spiritual guidance. Those suffering from Alzheimer's also experience intellectual pain and frustration as they lose their ability to remember and recognize others. Depression, anger, and frustration are elements of emotional pain, and family members can have tensions that a social worker or clergy member may be able to help resolve. Many patients are concerned with the financial burden their care will create for family members. And bureaucratic pain is also suffered while trying to submit bills and get information about health care benefits or to complete requirements for other legal matters. All of these concerns can be addressed by hospice care teams.

The Hospice Foundation of America notes that not all racial and ethnic groups feel the same way about hospice care. Certain groups may believe that medical treatment should be pursued on behalf of an ill relative as long as possible and that only God can decide when a person dies. Others may feel very uncomfortable discussing issues of death or being near the deceased family member's body. The view that hospice care should always be used is not held by everyone and health care providers need to be sensitive to the wishes and beliefs of those they serve. Similarly, the population of individuals using hospice services is not divided evenly by race. Approximately 81% of hospice patients are White, while 8.7% are African American, 8.7% are multiracial, 1.9% are Pacific Islander, and only 0.2% are Native American.

Watch It

The following video from the National Hospice and Palliative Care Organization discusses some of its goals regarding the increase in hospice care availability.

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Euthanasia and Physician-Assisted Suicide

Euthanasia, or helping a person fulfill their wish to die, can happen in two ways: voluntary euthanasia and physician-assisted suicide. **Voluntary euthanasia** refers to helping someone fulfill their wish to die by acting in such

a way to help that person's life end. This can be **passive euthanasia** such as no longer feeding someone or giving them food. Or it can be **active euthanasia** such as administering a lethal dose of medication to someone who wishes to die. In some cases, a dying individual who is in pain or constant discomfort will ask this of a friend or family member, as a way to speed up what he or she has already accepted as being inevitable. This can have lasting effects on the individual or individuals asked to help, including but not limited to prolonged guilt.

Physician-Assisted Suicide: Physician-assisted suicide occurs when a physician prescribes the means by which a person can end his or her own life. This differs from euthanasia, in that it is mandated by a set of laws and is backed by legal authority. Physician-assisted suicide is legal in the District of Columbia and several states, including Oregon, Hawaii, Vermont, and Washington. It is also legal in the Netherlands, Switzerland, and Belgium.

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Link to Learning

Dr. Jack Kevorkian is the individual most commonly associated with physician-assisted suicide. He was a pioneer in this practice, sparking ethical, moral, and legal debates that continue to this day. This video from the New York Times "Jack Kevorkian and the Right to Die" provides an overview of his work, and his role in the beginning of physician-assisted suicide.

The specific laws that govern the practice of physician-assisted suicide vary between states. Oregon, Vermont, and Washington, for example, require the prescription to come from either a Doctor of Medicine (M.D.) or a Doctor of Osteopathy (D.O.). These state laws also include a clause about the designated medical practitioner being willing to participate in this act. In Colorado, terminally ill individuals have the option to request and self-administer life-ending medication if their medical prognosis gives them six months or less to live. In the District of Columbia and Hawaii, the individual

is required to make two requests within predefined periods of time and also complete a waiting period, and in some cases undergo additional evaluations before the medication can be provided.

A growing number of the population support physician-assisted suicide. In 2000, a ruling of the U.S. Supreme Court upheld the right of states to determine their laws on physician-assisted suicide despite efforts to limit physicians' ability to prescribe barbiturates and opiates for their patients requesting the means to end their lives. The position of the Supreme Court is that the debate concerning the morals and ethics surrounding the right to die is one that should be continued. As an increasing number of the population enters late adulthood, the emphasis on giving patients an active voice in determining certain aspects of their own death is likely.

Physician-Assisted Suicide

In a recent example of physician-assisted death, David Goodall, a 104 year old professor, ended his life by choice in a Swiss clinic in May 2018. Having spent his life in Australia, Goodall traveled to Switzerland to do this, as the laws in his country do not allow for it. Swiss legislation does not openly permit physician-assisted suicide, but it does not forbid an individual with "commendable motives" from assisting another person in taking his or her own life. Watch this video of a news conference with Goodall "104-year-old Australian Promotes Right to Assisted Suicide" that took place the day before he ended his life with physician-assisted suicide.

Another public advocate for physician-assisted suicide and death with dignity was 29-year old Brittany Maynard,

who after being diagnosed with terminal brain cancer, decided to move to Oregon so that she could end her life with physician-assisted suicide. You can watch this video "The Brittany Maynard Story" to learn more about Brittany's story.

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Glossary

active coping: seeking information, working to solve problems; tends to produce more positive outcomes than passive coping

active euthanasia: a type of voluntary euthanasia that is active, such as administering a lethal dose of medication to someone who wishes to die

agonal breathing: gasping, labored breaths caused by an abnormal pattern of brainstem reflex

bereavement: the period of mourning following the death of someone

brain dead: when all brain function ceases to occur

clinical death: when the individual is brain dead

complicated grief: when feelings of grief are persistent and incapacitating

disenfranchised grief: grief that is not acknowledged by others

fading affect bias: idea that negative events, such as the death of a loved one, tend to lose their emotional intensity at a faster rate than pleasant events

functional death: when vital organs no longer function

euthanasia: helping a person fulfill their wish to die

grief: the psychological, physical, and emotional experience and reaction to loss

hospice: a type of care involving palliation without curative intent. Usually, it is used for people with no further options for curing their disease or people who have decided not to pursue further options that are arduous, likely to cause more symptoms, and not likely to succeed

palliative care: an interdisciplinary approach to specialized medical and nursing care for people with life-limiting illnesses. It focuses on providing relief from the symptoms, pain, physical stress, and mental stress at any stage of illness, with a goal of improving the quality of life for both the person and their family

passive coping: characterized by avoidance and distraction; outcomes tend to not be as positive as with active coping

passive euthanasia: a type of voluntary euthanasia that is passive, such as no longer feeding someone or giving them food

physician-assisted suicide: occurs when a physician prescribes the means by which a person can end his or her own life. This differs from euthanasia, in that it is mandated by a set of laws and is backed by legal authority. Physician-assisted suicide is legal in the District of Columbia and several states, including Oregon, Hawaii, Vermont, and Washington. It is also legal in the Netherlands, Switzerland, and Belgium

physiological death: when vital organs no longer function

psychological death: when a dying person begins to accept death and to withdraw from others and regress into the self

social death: when others begin to withdraw from someone who is terminally ill or has been diagnosed with a terminal illness

survivor guilt: mental condition that occurs when a person perceives themselves to have done wrong by surviving a traumatic event when others did not

vegetative state: the cerebral cortex no longer registers electrical activity but the brain stem continues to be active

voluntary euthanasia: helping someone fulfill their wish to die by acting in such a way to help that person's life end

EXTRA

Why learn about experiences and emotions related to death and dying?

***Figure 1**. Some form of marker is used in cemeteries to identify who is buried there. Headstones such as this one may vary by religion with prayers and symbols, as well as the deceased's name, years of birth and death, and family relationships. More elaborate stones and statues often reflect family prominence or wealth. Photo Courtesy Robert Paul Young*

"Everything has to die," he told her during a telephone conversation.

"I want you to know how much I have enjoyed being with you, having you as my friend, and confidant and what a good father you have been to me. Thank you so much." she told him.

"You are entirely welcome." he replied.

He had known for years that smoking will eventually kill him. But he never expected that lung cancer would take his life so quickly or be so painful. A diagnosis in late summer was followed with radiation and chemotherapy during which time there were moments of hope interspersed with discussions about where his wife might want to live after his death and whether or not he would have a blood count adequate to let him precede with his next treatment. Hope and despair exist side by side. After a few months, depression and quiet sadness preoccupied him although he was always willing to relieve others by reporting that he 'felt a little better' if they asked. He

returned home in January after one of his many hospital stays and soon grew worse. Back in the hospital, he was told of possible treatment options to delay his death. He asked his family members what they wanted him to do and then announced that he wanted to go home. He was ready to die. He returned home. Sitting in his favorite chair and being fed his favorite food gave way to lying in the hospital bed in his room and rejecting all food. Eyes closed and no longer talking, he surprised everyone by joining in and singing "Happy birthday" to his wife, son, and daughter-in-law who all had birthdays close together. A pearl necklace he had purchased 2 months earlier in case he died before his wife's birthday was retrieved and she told him how proud she would be as she wore it. He kissed her once and then again as she said goodbye. He died a few days later.

A dying process that allows an individual to make choices about treatment, to say goodbyes and to take care of final arrangements is what many people hope for. Such a death might be considered a "good death." But of course, many deaths do not occur in this way. Not all deaths include such a dialogue with family members or being able to die in familiar surroundings; people may die suddenly and alone, or people may leave home and never return. Children sometimes precede parents in death; wives precede husbands, and the homeless are bereaved by strangers.

In this module, we will look at death and dying, grief and bereavement, palliative care, and hospice to better understand these last stages of life.

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Why understand human development during infancy?

Welcome to the story of development from infancy through toddlerhood; from birth until about two years of age. Did you ever wonder how babies grow from tiny, helpless infants into well-developed and independent adults? It doesn't happen overnight, but the process begins right from day one. Infancy is a time when tremendous growth, coordination, and mental development occur. Most infants learn to walk, manipulate objects and can form basic words by the end of infancy. By 5 months a baby will have doubled its birth weight and tripled its birth weight by the first year. By the age of 2, a baby's weight will have quadrupled!

Researchers have given this part of the life span more attention than any other period, perhaps because changes during this time are so dramatic and so noticeable. We know that much of what happens during these years provides a foundation for one's life to come, however, it has been argued that the significance of development during these years has been overstated (Bruer, 1999). Nevertheless, this is a period of life that contemporary educators, healthcare providers, and parents have focused on quite heavily. It is also a time period that can be tricky to study—how do we learn about infant speech when they cannot articulate their thoughts or feelings? For example, through research we know that infants understand speech much earlier than their bodies have matured enough to physically perform it; thus it is evident that their speech patterns develop before the physical growth of their vocal cords is adequate to facilitate speech.

In this module, we will examine the rapid physical growth and development of infants, look at the influences on physical growth and cognitive development, then turn our attention toward emotional and social development in the early years of life. The early years are a time of rapid physical, cognitive, social, and emotional development, which have a direct effect on a baby's overall development and the adult they will become.

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Why learn about development during early childhood?

The time between a child's second and sixth birthday is a time of rich development in many ways. Children are growing rapidly physically, cognitively, and socially. Children are developing language skills that will help them navigate their world as they prepare to enter school. In fact, a child will go from being able to produce approximately 50 words at age 2 to producing over 2000 words at age 6! The number of words these children understand is even greater!

Children in this stage are changing from intuitive problem solvers into more sophisticated logical problem solvers. Their cognitive skills are increasing at a rapid rate, even though their brain is beginning to *lose* neurons through the process of synaptic pruning.

Children are also learning to navigate the social world around

them. They are learning about themselves and beginning to develop their own self-concept, while at the same time they are becoming aware that other people have feelings, too. The development that happens in these four years impacts the rest of the child's life in many ways for years to come.

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Why learn about development during middle childhood?

When Raekwon first started school, he wasn't sure that he would like it. The thought of going to one place for a long time every day seemed sort of boring. Raekwon found that school was actually really exciting, though. He made friends, he got to learn about new things, he got to play at recess, and the food was good! He found that the days actually went by quickly! Now in fourth grade, Raekwon cannot wait for summer to be over so that he can go to school and meet-up with his friends regularly again.

Middle childhood is the period of life that begins when children enter school and lasts until they reach adolescence. Think for a moment about children at this age that you may know. What are their lives like? What kinds of concerns do they express and with

what kinds of activities are their days filled? If it were possible, would you want to return to this period of life? Why or why not?

Early childhood and adolescence seem to get much more attention than middle childhood. Perhaps this is because growth patterns slow at this time, the id becomes hidden during the latent stage, according to Freud, and children spend much more time in schools, with friends, and in structured activities. It may be easy for parents to lose track of their children's development unless they stay directly involved in these worlds. It is important to stop and give full attention to middle childhood to stay in touch with these children and to take notice of the varied influences on their lives in a larger world. After all, they are developing in many incredible ways.

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Why understand the physical, cognitive, emotional, and social changes that occur during adolescence?

Adolescence is a socially constructed concept. In pre-industrial society, children were considered adults when they reached physical maturity; however, today we have an extended time between childhood and adulthood known as adolescence. Adolescence is the period of development that begins at puberty and ends at early adulthood or emerging adulthood; the typical age range is from 12 to 18 years, and this stage of development has some predictable milestones.

Media portrayals of adolescents often seem to emphasize the problems that can be a part of adolescence. Gang violence, school shootings, alcohol-related accidents, drug abuse, and suicides

involving teens are all too frequently reflected in newspaper headlines and movie plots.[1] In the professional literature, too, adolescence is frequently portrayed as a negative stage of life—a period of storm and stress to be survived or endured (Arnett, 1999).[2] Adolescents are often characterized as impulsive, reckless and emotionally unstable. This tends to be attributed to "raging hormones" or what is now known as the "teen brain."

With all of the attention given to negative images of adolescents, the positive aspects of adolescence can be overlooked (APA, 2000). Most adolescents in fact succeed in school, are attached to their families and their communities, and emerge from their teen years without experiencing serious problems such as substance abuse or involvement with violence. Recent research suggests that it may be time to lay the stereotype of the "wild teenage brain" to rest. This research posits that brain deficits do not make teens do risky things; lack of experience and a drive to explore the world are the real factors. Evidence supports that risky behavior during adolescence is a normal part of development and reflects a biologically driven need for exploration – a process aimed at acquiring experience and preparing teens for the complex decisions they will need to make as adults (Romer, Reyna, & Satterthwaite, 2017).[3] Furthermore, McNeely & Blanchard (2009) described the adolescent years as a "time of opportunity, not turmoil."[4]

1. American Psychological Association (2002). Developing adolescent: A reference for professionals. Retrieved from https://www.apa.org/pubs/info/brochures/develop
2. Arnett, J. (1999). Adolescent storm and stress, reconsidered. American Psychologist, 54(5), 317-326.
3. Romer, D., Reyna, R.F., & Satterthwaite, T.D. (2017). Beyond stereotypes of adolescent risk taking: Placing the adolescent brain in developmental context. Developmental Cognitive Neuroscience, 27, 19-34.
4. McNeely, Clea and Jayne Blanchard. A Guide to Healthy Adolescent

Second only to infant development, adolescents experience rapid development in a short period of time. During adolescence, children gain 50% of their adult body weight, experience puberty and become capable of reproducing, and experience an astounding transformation in their brains. All of these changes occur in the context of rapidly expanding social spheres. Adolescents begin to learn about adult responsibilities and adult relationships. The details of growing bodies and the rational and irrational thinking of adolescents are covered in this module. As you will learn, although the physical development of adolescents is often completed by age 18, the brain requires many more years to reach maturity. Understanding these changes developmentally can help both adults and adolescents enjoy this second decade of life.

This module will outline changes that occur during adolescence in three domains: physical, cognitive, and psychosocial. Physical changes associated with puberty are triggered by hormones. Cognitive changes include improvements in complex and abstract thought, as well as development that happens at different rates in distinct parts of the brain and increases adolescents' propensity for risky behavior because increases in sensation-seeking and reward motivation precede increases in cognitive control. Within the psychosocial domain, changes in relationships with parents, peers, and romantic partners will be considered. Adolescents' relationships with parents go through a period of redefinition in which adolescents become more autonomous, and aspects of parenting, such as distal monitoring and psychological control, become more salient. Peer relationships are important sources of support and companionship during adolescence yet can also promote problem behaviors. Same-sex peer groups evolve into mixed-sex peer groups, and adolescents' romantic relationships

Development. Johns Hopkins Bloomberg School of Public Health. Retrieved from https://www.jhsph.edu/research/centers-and-institutes/center-for-adolescent-health/_docs/TTYE-Guide.pdf.

tend to emerge from these groups. Identity formation occurs as adolescents explore and commit to different roles and ideological positions.

No adolescent can truly be understood in separate parts—an adolescent is a "package deal." Change in one area of development typically leads to, or occurs in conjunction with, changes in other areas. Furthermore, no adolescent can be fully understood outside the context of his or her family, neighborhood, school, workplace, or community or without considering such factors as gender, race, sexual orientation, disability or chronic illness, and religious beliefs (APA, 2002).[5]

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5. American Psychological Association (2002). Developing adolescent: A reference for professionals.

Why learn about development changes during early adulthood?

Figure 1*. Age or another key milestone, such as graduation, may signify the transition to adulthood, but becoming an adult is a process that varies widely across cultures and individuals.*

When we are children and teens, we eagerly anticipate each and every birthday, waiting for the next big one…when we'll finally be grown up and have all the freedoms and rights enjoyed by those who are older than us. Indeed, there are opportunities to drive, buy a car, vote, go to college, join the military, drink, move out on our own, date, live together, get married, work, have children, buy a house, and more. This can be an awesome time in our lives, as we tend to be physically and cognitively strong and healthy, we dream and make plans for the future, find people to share our experiences, and try out new roles. It can also be challenging, stressful, and scary as we realize that a lot of responsibility comes with such freedom. We have probably all seen the coffee mugs that proclaim, "Adulting is

hard," or the t-shirts that announce, "I can't adult today" (typically worn by young adults!).

Development is a process, and we aren't suddenly adults at a certain age. In fact, we may even take longer to grow up these days. In this module, we'll learn about norms, trends, and theories about why certain patterns are forming. It's even been proposed that there is a new stage of development between adolescence and early adulthood, called "emerging adulthood," when young people don't quite feel like they are adults yet and wait longer to join the workforce, move out on their own, get married, and have children. Yet by the end of early adulthood, most of us will have accomplished the important developmental tasks of becoming more autonomous, taking care of ourselves and even others, committing to relationships and jobs/careers, getting married, raising families, and becoming part of our communities. There are, of course, many individual and cultural differences.

Think of your own life. When will you feel like an adult? Or do you already feel like an adult? Why or why not? Did your parents become adults earlier or later in their lives, compared to you?

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Why learn about human development during middle adulthood?

In 1225, St. Marher observed that "time and tide wait for no man." It is perhaps during middle adulthood that this observation begins its journey from the subconscious to its realization in the world of the everyday—too old to dream, but too young to die (we hope). However, this stage of life is truly as multi-faceted as any other. It is a period of negotiation, and renegotiation, across the three main facets of human existence: physical, psychological, and social.

Firstly, we will learn about the maintenance, protection, and promotion of physical health in middle adulthood. Our body may be the basis of our identity, of how we see ourselves; and one of the sources of our sense of self and self-worth. Who do you see when, quite literally, you look in the mirror? Secondly, there is the psychological accompaniment to that change. Does an individual

resent, accept, or confront, issues that arise at this time of life? Positive attitudes and mindfulness impact how change is perceived. Thirdly, social engagement and social support are critically important at this stage of life. Social roles may feel limiting, but they can also motivate and energize, and provide impetus to neurological and cognitive acuity. Our concept of self may not be fully ours to shape or control alone. How others see us, and their expectations of us, are age-sensitive as well.

From the developmental perspective, middle adulthood (or midlife) refers to the period of the lifespan between young adulthood and old age. This period lasts from 20 to 40 years depending on how these stages, ages, and tasks are culturally defined. The most common definition by chronological age for middle adulthood is from 40 to 65, but there can be a range of up to 10 years (ages 30-75) on either side of these parameters.

Research on this period of life is relatively sparse, and many aspects of midlife are still relatively unexplored; in fact it may be the least studied period of the lifespan. This is not as surprising as might initially appear. One hundred years ago, life expectancy in the United States was about 47 years. According to the Centers for Disease Control (CDC), in 2017 it stood at 76.1 for males and 81.1 for females. There is variation between groups, and it is generally agreed that this is due to patterns of social and economic inequality which impact health outcomes across the board, not just longevity. There are also variations across cultures. By 2040 it is estimated that the USA will have been reduced to 64th in the world from a position of 43rd in 2016 in mortality rankings (Foreman et al, 2018).[1]. Such projections must be placed in context. Longevity in the USA is still projected to rise, albeit more slowly than other developed countries such as Japan and Spain. Rates of so-called "lifestyle diseases" such as HBP, diabetes Type 2, substance abuse, smoking,are difficult to predict with exactness, as is the level of air

1. The Lancet, 2018.

pollution and other toxic environmental contaminants. This is not simply a question of people living longer, it is about the quality of life that they will enjoy, and how individuals and society are equipped to deal with these non-communicable diseases.

In the United States, the large Baby Boom cohort (those born between 1946 and 1964) are now midlife adults, which has led to increased interest in this developmental stage. The U.S. Census (2018) predicts that by 2030, when all boomers will be over 65, they will constitute 21% of the population, up from 15% today. Older adults (those over 65) will outnumber children (those under 18) for the first time in U.S. history by 2035. This will have profound social consequences. This demographic shift is already well advanced in European countries like Germany and Italy. How individuals prepare in middle adulthood for living longer, and being part of an older community, will assume even more critical importance. It may also present a formidable challenge in the areas of health and public policy, as the relative numbers of those who are economically active, or economically inactive, shift.

Developmental Tasks

Margie Lachman (2004) provides a comprehensive overview of the challenges facing midlife adults, outlining the roles and responsibilities of those entering the "afternoon of life" (Jung). These include:

1. Losing parents and experiencing associated grief.
2. Launching children into their own lives.
3. Adjusting to home life without children (often referred to as the empty nest).
4. Dealing with adult children who return to live at home (known as boomerang children in the United States).
5. Becoming grandparents.

6. Preparing for late adulthood.
7. Acting as caregivers for aging parents or spouses.

Taken singly or together, these can represent a fundamental reorientation of outlook, investment, attitudes, and personal relationships which can present formidable obstacles in terms of social and economic challenges. They may also be affected by circumstances outside our control, at a time that we may have envisaged as planned and under control.

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Why explain development and change through late adulthood?

Figure 1. *Calment celebrating her 121st birthday in 1996. She died in 1997 at age 122.*

Jeanne Calment was a typical woman of her time. Born in Arles, France, in 1875, she lived a rather unremarkable life by most accounts—except for one thing: when she died in 1997 at the age of 122, she was on record as the oldest person to have ever lived. "I just kept getting older and couldn't help it," she once said.

So what does the extraordinary life of this ordinary woman have to do with us today? More than you might think. In her day, living to 100 was extremely rare. But today in the United States, people 100 and over represent the second-fastest-growing age group in the country. The fastest? People over 85. Many 65-year-olds today will live well into their 90s.

Furthermore, because of increases in average life expectancy, each new generation can expect to live longer than their parents' generation and certainly longer than their grandparents' generation. Think of it another way: a 10-year-old child todayhas a 50 percent chance of living to the age of 104. Some demographers have even speculated that the first person ever to live to be 150 is alive today.

As a consequence, it is time for individuals of all ages to rethink

their personal life plans and consider prospects for a long life. We need to ask ourselves questions such as:

- What do we know about longevity?
- How does our brain and body change during this part of our lifespan?
- How can I age successfully and enjoy life to the fullest?

In this module we will discuss several different domains of physical, cognitive, psychological and social development, as well as research on aging that will help answer these important questions.
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Up until middle childhood, the process of development isn't usually as structured as it becomes during middle childhood, when children enter into the formal education setting. Children in school are taught new ways of thinking about things that they already know—they learn *why* they structure sentences the way they do, they learn new words not through hearing them from others, but from lists provided by teachers or determined by committees. They are even taught how to play sports in specific ways with explicit rules that they get tested on in written form. This is quite a departure from the organic learning of younger years.

Learning in this new way is difficult for some children who have never had to sit down for formal instruction. Structured learning can also shed light on learning difficulties and learning disabilities. Educators today are trained to recognize the signs of many learning disabilities so that children can get help early on in their academic careers.

Developing social relationships in the school environment and keeping up with the changing relationships at home can be difficult tasks for children during middle childhood. Children begin the

period relatively dependent on parents and by the end of the period, children should be able to act autonomously in terms of decision making and caring for themselves. This change may feel quick to parents, and it can be difficult for them to let go of control and to allow the child to make more decisions. In order for the child to continue healthy development, though, that gradual letting go is necessary. Parents should pay close attention to their children to recognize signs that the child is capable of taking on new responsibilities.This will help the child continue to develop their skills, their sense of self, their sense of place in the family, and their sense of place in the greater community.

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Adolescent development is characterized by significant biological, cognitive, and pyschosocial changes. Physical changes associated with puberty are triggered by hormones and changes in the brain in which reward-processing centers develop more rapidly than cognitive control systems, making adolescents more sensitive to rewards than to possible negative consequences. Cognitive changes include improvements in complex and abstract thought and moral reasoning. Psychosocial changes are particularly notable as adolescents become more autonomous from their parents, spend more time with peers, and begin exploring romantic relationships and sexuality.

Adjustment during adolescence is reflected in identity formation, which often involves a period of exploration followed by commitments to particular identities. Adolescents' relationships with parents go through a period of redefinition in which adolescents become more autonomous, and aspects of parenting, such as monitoring and psychological control, become more salient.

Peer relationships are important sources of support and companionship during adolescence, yet can also promote problem behaviors. Same-sex peer groups evolve into mixed-sex peer groups, and adolescents' romantic relationships tend to emerge from these groups. Identity formation occurs as adolescents explore and commit to different roles and ideological positions. Despite these generalizations, factors such as country of residence, gender, ethnicity, and sexual orientation shape development in ways that lead to diversity of experiences across adolescence.

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Usually, sometime at the beginning of early childhood, a parent will suddenly realize that their child is no longer a baby. This may happen because the child has physically grown and no longer has baby-like features, but more often it is because all of a sudden the parent realizes that this child is becoming independent. The child might be choosing their outfit for the day, or trying to learn to tie their shoelaces. It usually happens when the child is around two years old, right as early childhood is beginning. This realization that a baby is no longer a baby, that they are a *child*, is just the beginning.

As you have learned in this module, early childhood is a time of great changes for children. While the child is still obviously a child physically, in the 4-year span of early childhood they make great strides in development—by the end of this period a child's brain is nearly adult-sized! At the same time, that nearly adult-sized brain is not ready to perform many adult tasks—there is much learning still to be done in terms of building relationships, moral decision making, and in other cognitive realms. Children go from knowing

around 200 words at age two to being able to communicate in adult-like ways with a vocabulary recognizing over 10,000 words by age five, but think about how many new words you have had to learn just to succeed in this class! Ten thousand words sounds like a lot, but there are over 170,000 words in the English Language, and the average adult knows over 40,000 words.[1]

Parents caring for children in early childhood contribute greatly to development in direct and in indirect ways. Teaching new words, laying-down expectations for behavior in different contexts, choosing daycare centers, helping to build self-confidence, and providing general care for the child all contribute to the child's healthy development through early childhood. Parents and other caretakers should encourage healthy habits in their young children, including making healthy food choices and exercising the body and the brain. They should challenge children to think in new ways and create opportunities for children to learn about themselves so that they can develop a healthy and realistic self-concept.

The learning that happens for children in early childhood is the stepping stone for the next stage, middle childhood. Many of the advances that began in early childhood will continue to be refined in the next stage.

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1. de Leon Huld, Nickee. "How Many Words Does the Average Person Know?" Word Counter. Retrieved from https://wordcounter.io/blog/how-many-words-does-the-average-person-know/

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We have explored the dramatic story of the first two years of life. Rapid physical growth, neurological development, language acquisition, the movement from hands-on to mental learning, an expanding emotional repertoire, and the initial conceptions of self and others make this period of life very exciting. These abilities are shaped into more sophisticated mental processes, self-concepts, and social relationships during the years of early childhood.

Babies begin to learn about the world around them from a very early age. Children's early experiences, meaning the bonds they form with their parents and their first learning experiences, affect their future physical, cognitive, emotional and social development. Various organizations and agencies are dedicated to helping parents (and other caregivers), educators, and health care providers understand the importance of early healthy development. Healthy development means that children of all abilities, including those with special health care needs, are able to grow up where their social, emotional, and educational needs are met. Having a safe

and loving home and spending time with family—playing, singing, reading, and talking—are very important. Proper nutrition, exercise, and sleep can also make a big difference; and effective parenting practices are key to supporting healthy development (CDC, 2019). The need to invest in very young children is important to maximize their future well-being.

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The period of late adulthood, which starts around age 65, is characterized by great changes and ongoing personal development. Older adults face profound physical, cognitive, and social changes, and many figure out strategies for adjusting to them and successfully cope with old age. In late adulthood people begin the decline that will be part of their lives until death. The declines in the senses—vision, hearing, taste, and smell—can have major psychological consequences. Most illnesses and diseases of late adulthood are not particular to old age, but the incidences of cancer and heart disease rise with age. People in late adulthood are also more prone to develop arthritis, hypertension, major neurocognitive disorders, and Alzheimer's disease. Proper diet, exercise, and avoidance of health risks can all lead to overall well-being during old age, and sexuality can continue throughout the lifespan in healthy adults. Thus, many older adults can maintain

physical and mental strength until the they die, and their social worlds can also remain as vital and active as they want.

Cognitively, we find that older people adjust quite well to the challenges of aging by adopting new strategies for solving problems and compensating for loss abilities. Although some intellectual abilities gradually decline throughout adulthood, starting at around the age 25, others stay relatively steady. For example, research shows that while fluid intelligence declines with age, crystallized intelligence remains steady, and may even improve, in late adulthood. Many cognitive abilities can be maintained with stimulation, practice, and motivation. Declines in memory affect mainly episodic memory and short-term memory, or working memory. Explanations of memory changes in old age focus upon environmental factors, information processing declines, and biological factors. Due to this perceived loss of abilities by others, older people are often subject to ageism, or prejudice and discrimination against people based on their age.

Socially, many of older adults become adept at coping with the changes in their lives, such as death of a spouse and retirement from work. Erikson calls older adulthood the integrity vs. despair stage. According to Erikson, individuals in late adulthood engage in looking back over their lives, evaluating their experiences and coming to terms with decisions. Other theorists focus on the tasks that define late adulthood and suggest that older people can experience liberation and self-regard. Marriages in older adulthood are generally happy, but the many changes in late adulthood can cause stress which may result in divorce. The death of a spouse has major psychological, social, and material effects on the surviving widow and makes the formation and continuation of friendships highly important. Family relationships are a continuing part of most older people's lives, especially relationships with siblings, children and grandchildren. Friendships, an important source of social support, are not only valued, but needed in late adulthood.

Whether death is caused by genetic programming or by general physical wear-and-tear is an unresolved question. Life expectancy,

which has risen for centuries, varies with gender, race, and ethnicity and new approaches to increasing life expectancy is a growing topic of research.

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At the beginning of this section we referred to the physical, psychological, and social/spiritual Can we take out the spiritual? I don't see it here... aspects of middle adulthood. These have ranged from minor physiological changes to the way that knowledge of our own mortality may influence how we behave and feel during this part of the lifespan. The central theme might be identified as that of connection—the way that the body and mind are connected, how one can effect the other, exemplified by the way that physical mobility can impact cerebral acuity. In addition, we have learned that we are more selective in regard to interpersonal connection as we age. The positive aspects of relationships, work, and family assume ever greater importance. Hope is ever present, but these sorts of positive and fulfilling connections cannot be postponed indefinitely. Freud believed that civilization was only possible if humans could be induced, or trained, to defer immediate gratification. That was what the process of primary childhood socialization was about. Perhaps middle adulthood demands that

we unlearn this, if only partially. At this stage of the life course, it is now or never. Time is finite and there is none left for indefinite postponement. This is what modern developmental theory has come to understand as mortality salience.

Developmental perspectives have tended to view intimacy and familial relationships as a universal need and function. It has largely left their transformation by divorce, cohabitation and so forth to the sociologists. However, there is now a clearer understanding of the way that structural economic and social change have impacted family structures, often in those least able to resist the disruptive effects of social inequality (Cherlin, 2014). Income and education levels play as large a part in all of this as lifestyle choices, and selectivity. We can only hope that advances in medical science can lead to greater quality of life at this stage of the life course, and that they are made widely available.

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Death is something we all must face at some point. It occurs on physiological, psychological, and social levels, each of which have unique implications for the dying individuals and those close to them. Physiological death occurs as the body ceases to function, eventually rendering the individual unable to engage in basic necessary processes, such as breathing and eating. Psychological death occurs when the individual begins to face his or her impending death and consequently regresses into the self. Societal death occurs when others withdraw from the individual, perhaps unable to effectively cope with the impending loss and its implications. In some cases, palliative care or hospice services are utilized to assist both the dying individual and his or her family throughout the dying process. These services include care for the dying individual, as well as support for the family. In addition, several states allow terminally ill or dying individuals to utilize physician-assisted suicide, in which a medical practitioner prescribes and/or administers life-ending medication at the

individual's request. The utilization of palliative or hospice care services, as well as physician assisted suicide, vary between individuals, cultures, and racial groups, ultimately reflecting the legal, ethical, and moral complexity of both types of practices.

The way in which we view death, talk about it, prepare for it, and what we do when it happens, vary both within and between cultures. Coping with the grief that is associated with death and loss is a complex but necessary process, with a number of strategies for working through the situation in a healthy and positive way. Several theories have been created to explain how grieving happens, some including stages of grief that the individual experiences, others including tasks that the individual must complete. These stages and tasks on their own are neutral, with the potential to facilitate positive coping, but can also become maladaptive if the individual does not work through them in a healthy way. Death is ultimately the end of lifespan development, an occurrence that takes place for everyone at some time. It is the culmination of the other stages of development, many of which play a role in shaping how the individual handles death when the time comes, both for the self and for loved ones.

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As we have learned in this module, young adults are often in the "prime of life," especially physically and sexually. However, young adults may be engaged in risky behaviors and be particularly vulnerable to injuries, accidents, alcohol and drug use/abuse, sexually transmitted diseases, rape, and suicide. Nutrition and exercise habits in this stage are important since they are associated with health and certain illnesses in middle age. Cognitive and brain development continues, with the influences of education and experience. Young adults may move from formal logical thinking to postformal thinking, becoming better at considering multiple perspectives and contexts, appreciating ambiguity and uncertainty, and using practical experience in making decisions.

Higher education plays an important role for more and more young adults—in this module we examined the connections between education and work and learned about how exploring and choosing one's career is key during this stage. We saw that establishing intimacy in friendships, romance, and family

relationships is another significant aspect of young adulthood; love, dating, cohabitation, marriage, and becoming parents were all examined.

We were introduced to the major theories of adult development, primarily those of Erikson and Levinson, and we learned about Arnett's "emerging adulthood," a potentially new stage involving the transition from adolescence to young adulthood, with young adults taking on "adult roles" later than expected. By the late thirties, though, most young adults have become independent of their parents/families of origin and are in the throes of adult work, family, and community activities and responsibilities.

Please read the article below for a summary of some of these early adulthood topics, but from a slightly different perspective—that of generations or cohorts. "Millennials" are defined as individuals who were born between 1981 and 1996, and as such, they make up a large part of today's young adults. Read about this group in terms of education, work, finances, living with parents, getting married, and having children, comparing their norms with those of previous generations and potentially future generations of young adults. Consider "emerging adulthood"; how much do you think generation, history, and culture are affecting this observed phenomenon? Will it continue to be part of early adulthood development in the future? Why or why not?

Link to Learning: Millenials and other generations

Read this article "Millennial life: How young adulthood today compares with prior generations" from the Pew Research Center.

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Late Adulthood

Learning Outcomes

- Describe age categories of late adulthood

Defining Late Adulthood: Age or Quality of Life?

Photo Courtesy Overstreet

We are considered in late adulthood from the time we reach our mid-sixties until death. Because we are living longer, late adulthood is getting longer. Whether we start counting at 65, as demographers may suggest, there is a greater proportion of people alive in late adulthood than anytime in world history. In this module, we will learn how many people are in late adulthood, how that number is expected to change, and how life changes and continues to be the same as before in late adulthood. About 13 percent of the U. S. population or 38.9 million Americans are 65 and older (U. S. Census Bureau, 2011). This number is expected to grow to 88.5 million by the year 2050 at which time

people over 65 will make up 20 percent of the population. This group varies considerably and is divided into categories of 65 plus, 85 plus, and centenarians for comparison by the census. Developmentalists, however, divide this population in to categories based on health and social well-being. Optimal aging refers to those who enjoy better health and social well-being than average. Normal aging refers to those who seem to have the same health and social concerns as most of those in the population. However, there is still much being done to understand exactly what normal aging means. Impaired aging refers to those who experience poor health and dependence to a greater extent than would be considered normal. Aging successfully involves making adjustments as needed in order to continue living as independently and actively as possible. This is referred to as selective optimization with compensation and means, for example, that a person who can no longer drive, is able to find alternative transportation. Or a person who is compensating for having less energy, learns how to reorganize the daily routine to avoid over-exertion. Perhaps nurses and other allied health professionals working with this population will begin to focus more on helping patients remain independent than on simply treating illnesses. Promoting health and independence are important for successful aging.

Age Categories: *The young old* 65 to 74

These 18.3 million Americans tend to report greater health and social well-being than older adults. Having good or excellent health is reported by 41 percent of this age group (Center for Disease Control, 2004). Their lives are more similar to those of midlife adults than those who are 85 and older. This group is less likely to require long-term care, to be dependent or to be poor, and more likely to be married, working for pleasure rather than income, and living independently. About 65 percent of men and 50 percent of women

between the ages of 65-69 continue to work full-time (He et al., 2005). Physical activity tends to decrease with age, despite the dramatic health benefits enjoyed by those who exercise. People with more education and income are more likely to continue being physically active. And males are more likely to engage in physical activity than are females. The majority of the young-old continue to live independently. Only about 3 percent of those 65-74 need help with daily living skills as compared with about 22.9 percent of people over 85. (Another way to consider think of this is that 97 percent of people between 65-74 and 77 percent of people over 85 do not require assistance!) This age group is less likely to experience heart disease, cancer, or stroke than the old, but nearly as likely to experience depression (U. S. Census, 2005).

The old old 75 to 84

This age group is more likely to experience limitations on physical activity due to chronic disease such as arthritis, heart conditions, hypertension (especially for women), and hearing or visual impairments. Rates of death due to heart disease, cancer, and cerebral vascular disease are double that experienced by people 65-74. Poverty rates are 3 percent higher (12 percent) than for those between 65 and 74. However, the majority of these 12.9 million Americans live independently or with relatives. Widowhood is more common in this group-especially among women.

The oldest old 85 plus

The number of people 85 and older is 34 times greater than in 1900 and now includes 5.7 million Americans. This group is more likely to require long-term care and to be in nursing homes. However, of the

38.9 million American over 65, only 1.6 million require nursing home care. Sixty-eight percent live with relatives and 27 percent live alone (He et al., 2005; U. S. Census Bureau, 2011).

The Centenarians

There are 104,754 people over 100 years of aging living in the United States. This number is expected to increase to 601,000 by the year 2050 (U. S. Census Bureau, 2011). The majority is between ages 100 and 104 and eighty percent are women. Out of almost 7 billion people on the planet, about 25 are over 110. Most live in Japan, a few live the in United States and three live in France (National Institutes of Health, 2006). These "super-Centenarians" have led varied lives and probably do not give us any single answers about living longer. Jeanne Clement smoked until she was 117. She lived to be 122. She also ate a diet rich in olive oil and rode a bicycle until she was 100. Her family had a history of longevity. Pitskhelauri (in Berger, 2005) suggests that moderate diet, continued work and activity, inclusion in family and community life, and exercise and relaxation are important ingredients for long life.

Try It

What is the approximate age of onset of late adulthood?

a. 50

~feedback: Incorrect. This age is considered middle adulthood

b. 65*

~feedback: Correct. The young old are 65 – 74 years old

c. 75

~feedback: Incorrect. The old old are between 75 and 84

d. 85

~feedback: Incorrect. The oldest old are 85 and older

The "Graying" of America and the globe:

This trend toward an increasingly aged population has been referred to as the "graying of America." However, populations are aging in most other countries of the world. (One exception to this is in sub-Saharan Africa where mortality rates are high due to HIV/AIDS) (He et al., 2005). There are 520 million people over 65 worldwide. This number is expected to increase to 1.53 billion by 2050 (from 8 percent to 17 percent of the global population.) Currently, four countries, Germany, Italy, Japan, and Monaco, have 20 percent of their population over 65. China has the highest number of people over 65 at 112 million (U. S. Census Bureau, 2011).

As the population ages, concerns grow about who will provide for those requiring long-term care. In 2000, there were about 10 people 85 and older for every 100 persons between ages 50 and 64. These midlife adults are the most likely care providers for their aging parents. The number of old requiring support from their children

is expected to more than double by the year 2040 (He et al., 2005). These families will certainly need external physical, emotional, and financial support in meeting this challenge.

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