1: INTRODUCTION TO CHILD DEVELOPMENT

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CHAPTER OVERVIEW

1: Introduction to Child Development

Learning Objectives

After this chapter, you should be able to:

- Describe the principles that underlie development.
- Differentiate periods of human development.
- Evaluate issues in development.
- Distinguish the different methods of research.
- Explain what a theory is.
- Compare and contrast different theories of child development.

Welcome to Child Growth and Development. This text is a presentation of how and why children grow, develop, and learn. We will look at how we change physically over time from conception through adolescence. We examine cognitive change, or how our ability to think and remember changes over the first 20 years or so of life. And we will look at how our emotions, psychological state, and social relationships change throughout childhood and adolescence.1

1.1: Principles of Development

There are several underlying principles of development to keep in mind:

- Development is lifelong and change is apparent across the lifespan (although this text ends with adolescence). And early experiences affect later development.
- Development is multidirectional. We show gains in some areas of development while showing loss in other areas.
- Development is multidimensional. We change across three general domains/dimensions; physical, cognitive, and social and emotional.
    - The physical domain includes changes in height and weight, changes in gross and fine motor skills, sensory capabilities, the nervous system, as well as the propensity for disease and illness.
    - The cognitive domain encompasses the changes in intelligence, wisdom, perception, problem-solving, memory, and language.
    - The social and emotional domain (also referred to as psychosocial) focuses on changes in emotion, self-perception, and interpersonal relationships with families, peers, and friends.

All three domains influence each other. It is also important to note that a change in one domain may cascade and prompt changes in the other domains.

- Development is characterized by plasticity, which is our ability to change and that many of our characteristics are malleable. *Early experiences are important, but children are remarkably resilient (able to overcome adversity).*
- Development is multicontextual.2 We are influenced by both nature (genetics) and nurture (the environment) - when and where we live and our actions, beliefs, and values are a response to circumstances surrounding us. The key here is to understand that behaviors, motivations, emotions, and choices are all part of a bigger picture.3

Now let's look at a framework for examining development.

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1.2: Periods of Development

Think about what periods of development that you think a course on Child Development would address. How many stages are on your list? Perhaps you have three: infancy, childhood, and teenagers. Developmentalists (those that study development) break this part of the life span into these five stages as follows:

- Prenatal Development (conception through birth)
- Infancy and Toddlerhood (birth through two years)
- Early Childhood (3 to 5 years)
- Middle Childhood (6 to 11 years)
- Adolescence (12 years to adulthood)

This list reflects unique aspects of the various stages of childhood and adolescence that will be explored in this book. So while both an 8-month-old and an 8-year-old are considered children, they have very different motor abilities, social relationships, and cognitive skills. Their nutritional needs are different and their primary psychological concerns are also distinctive.

Prenatal Development

Conception occurs and development begins. All of the major structures of the body are forming and the health of the mother is of primary concern. Understanding nutrition, teratogens (or environmental factors that can lead to birth defects), and labor and delivery are primary concerns.

Figure 1.2.1: A tiny embryo depicting some development of arms and legs, as well as facial features that are starting to show. (Image by lunar caustic is licensed under CC BY 2.0)

Infancy and Toddlerhood

The two years of life are ones of dramatic growth and change. A newborn, with a keen sense of hearing but very poor vision, is transformed into a walking, talking toddler within a relatively short period of time. Caregivers are also transformed from someone who manages feeding and sleep schedules to a constantly moving guide and safety inspector for a mobile, energetic child.

Figure 1.2.2: A swaddled newborn. (Image by Han Myo Htwe on Unsplash)

Early Childhood

Early childhood is also referred to as the preschool years and consists of the years which follow toddlerhood and precede formal schooling. As a three to five-year-old, the child is busy learning language, 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 fearing that they may go down the drain if they sit at the front of the bathtub or by 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 action that brings the disapproval of others.

Figure 1.2.3: Two young children playing in the Singapore Botanic Gardens (Image by Alaric Sim on Unsplash)

Middle Childhood

The ages of six through eleven 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 by assessing one's abilities and accomplishments by making comparisons between self and others. Schools compare students and make these comparisons public through team sports, test scores, and other forms of recognition. Growth rates slow down and children are able to refine their motor skills at this point in life. And children begin to learn about social relationships beyond the family through interaction with friends and fellow students.

Figure 1.2.4: Two children running down the street in Carenage, Trinidad, and Tobago (Image by Wayne Lee-Sing on Unsplash)

Adolescence

Adolescence is a period of dramatic physical change marked by an overall physical growth spurt and sexual maturation, known as puberty. 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.8

Figure 1.2.5: Two smiling teenage women. (Image by Matheus Ferrero on Unsplash)

There are some aspects of development that have been hotly debated. Let's explore these.

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1.3: Issues in Development

Nature and Nurture

Why are people the way they are? Are features such as height, weight, personality, being diabetic, etc. the result of heredity or environmental factors-or both? For decades, scholars have carried on the "nature/nurture" debate. For any particular feature, those on the side of Nature would argue that heredity plays the most important role in bringing about that feature. Those on the side of Nurture would argue that one's environment is most significant in shaping the way we are. This debate continues in all aspects of human development, and 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.

Continuity versus Discontinuity

Is human development best characterized as a slow, gradual process, or is it best viewed as one of the more abrupt changes? The answer to that question often depends on which developmental theorist you ask and what topic is being studied. The theories of Freud, Erikson, Piaget, and Kohlberg are called stage theories. Stage theories or discontinuous development assume that developmental change often occurs in distinct stages that are qualitatively different from each other, and in a set, universal sequence. At each stage of development, children and adults have different qualities and characteristics. Thus, stage theorists assume development is more discontinuous. Others, such as the behaviorists, Vygotsky, and information processing theorists, assume development is a more slow and gradual process known as continuous development. For instance, they would see the adult as not possessing new skills, but more advanced skills that were already present in some form in the child. Brain development and environmental experiences contribute to the acquisition of more developed skills.

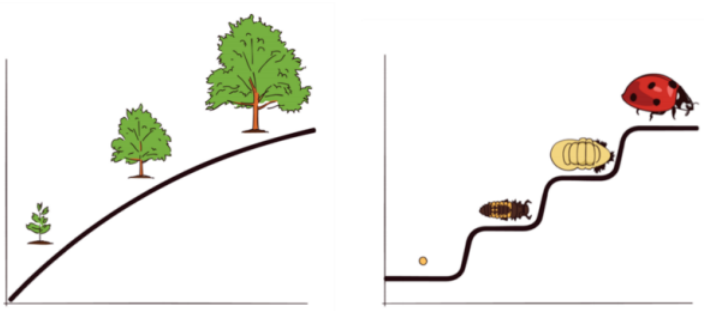

Figure 1.3.1: The graph to the left shows three stages in the continuous growth of a tree. The graph to the right shows four distinct stages of development in the life cycle of a ladybug. (Image by NOBA is licensed under CC BY-NC-SA 4.0)

Active versus Passive

How much do you play a role in your own developmental path? Are you at the whim of your genetic inheritance or the environment that surrounds you? Some theorists see humans as playing a much more active role in their own development. Piaget, for instance, believed that children actively explore their world and construct new ways of thinking to explain the things they experience. In contrast, many behaviorists view humans as being more passive in the developmental process.11

How do we know so much about how we grow, develop, and learn? Let’s look at how that data is gathered through research

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1.4: Research Methods

An important 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. Some people are hesitant to trust academicians or researchers because they always seem to change their story. That, however, is exactly 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.

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

Paris in the the spring

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

Paris in the the spring

If you read it differently the second time (adding the second “the”) you just experienced one of the problems with 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. 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. Popper suggests 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). 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 guard against bias.

Scientific Methods

One method of scientific investigation involves the following steps: 1. Determining a research question 2. Reviewing previous studies addressing the topic in question (known as a literature review) 3. Determining a method of gathering information 4. Conducting the study

5. Interpreting results 6. Drawing conclusions; stating limitations of the study and suggestions for future research 7. Making your findings available to others (both to share information and to have your work scrutinized by others)

Your findings can then be used by others as they explore the area of interest and through this process a literature or knowledge base is established. This model of scientific investigation presents research as a linear process guided by a specific research question. And it typically involves quantifying or using statistics to understand and report what has been studied. Many academic journals publish reports on studies conducted in this manner.

Another model of research referred to as qualitative research may involve steps such as these: 1. Begin with a broad area of interest 2. Gain entrance into a group to be researched 3. Gather field notes about the setting, the people, the structure, the activities or other areas of interest 4. Ask open ended, broad “grand tour” types of questions when interviewing subjects 5. Modify research questions as study continues 6. Note patterns or consistencies 7. Explore new areas deemed important by the people being observed 8. Report findings

In this type of research, theoretical ideas are “grounded” in the experiences of the participants. The researcher is the student and the people in the setting are the teachers as they inform the researcher of their world (Glazer & Strauss, 1967). Researchers are to be aware of their own biases and assumptions, acknowledge them and bracket them in efforts to keep them from limiting accuracy in reporting. Sometimes qualitative studies are used initially to explore a topic and more quantitative studies are used to test or explain what was first described.

Research Methods

Let's look more closely at some techniques, or research methods, used to describe, explain, or evaluate. Each of these designs has strengths and weaknesses and is sometimes used in combination with other designs within a single study.

Observational Studies

Observational studies involve watching and recording the actions of participants. This may take place in the natural setting, such as observing children at play at a park, or behind a one-way glass while children are at play in a laboratory playroom. The researcher may follow a checklist and record the frequency and duration of events (perhaps how many conflicts occur among 2-year-olds) or may observe and record as much as possible about an event (such as observing children in a classroom and capturing the details about the room design and what the children and teachers are doing and saying). In general, observational studies have the strength of allowing the researcher to see how people behave rather than relying on self-report. What people do and what they say they do are often very different. A major weakness of observational studies is that they do not allow the researcher to explain causal relationships. Yet, observational studies are useful and widely used when studying children. Children tend to change their behavior when they know they are being watched (known as the Hawthorne effect) and may not survey well.

Experiments

Experiments are designed to test hypotheses (or specific statements about the relationship between variables) in a controlled setting in efforts to explain how certain factors or events produce outcomes. A variable is anything that changes in value. Concepts are operationalized or transformed into variables in research, which means that the researcher must specify exactly what is going to be measured in the study.

Three conditions must be met in order to establish cause and effect. Experimental designs are useful in meeting these conditions. 1. The independent and dependent variables must be related. In other words, when one is altered, the other changes in response. (The independent variable is something altered or introduced by the researcher. The dependent variable is the outcome or the factor affected by the introduction of the independent variable. For example, if we are looking at the impact of exercise on stress levels, the independent variable would be exercise; the dependent variable would be stress.) 2. The cause must come before the effect. Experiments involve measuring subjects on the dependent variable before exposing them to the independent variable (establishing a baseline). So we would measure the subjects' level of stress before introducing exercise and then again after the exercise to see if there has been a change in stress levels. (Observational and survey research does not always allow us to look at the timing of these events, which makes understanding causality problematic with these designs.) 3. The cause must be isolated. The researcher must ensure that no outside, perhaps unknown variables are actually causing the effect we see. The experimental design helps make this possible. In an experiment, we would make sure that our subjects' diets were held constant throughout the exercise program. Otherwise, the diet might really be creating a change in stress level rather than exercise.

A basic experimental design involves beginning with a sample (or subset of a population) and randomly assigning subjects to one of two groups: the experimental group or the control group. The experimental group is the group that is going to be exposed to an independent variable or condition the researcher is introducing as a potential cause of an event. The control group is going to be used for comparison and is going to have the same experience as the experimental group but will not be exposed to the independent variable. After exposing the experimental group to the independent variable, the two groups are measured again to see if a change has occurred. If so, we are in a better position to suggest that the independent variable caused the change in the dependent variable.

The major advantage of the experimental design is that of helping to establish cause and effect relationships. A disadvantage of this design is the difficulty of translating much of what happens in a laboratory setting into real life.

Case Studies

Case studies involve 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. Case studies are helpful when investigating unusual situations such as brain trauma or children reared in isolation. And they are often used by clinicians who conduct case studies as part of their normal practice when gathering information about a client or patient coming in for treatment. Case studies can be used to explore areas about which little is known and can provide rich detail about situations or conditions. However, the findings from case studies cannot be generalized or applied to larger populations; this is because cases are not randomly selected and no control group is used for comparison.

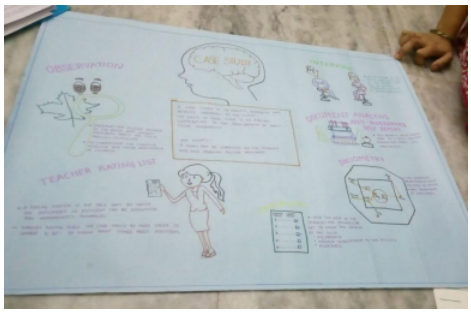

Figure 1.4.1: Illustrated poster from a classroom describing a case study. (Image by MaryGeorge is licensed under CC BY-SA 4.0)

Surveys

Surveys are familiar to most people because they are so widely used. Surveys enhance accessibility to subjects because they can be conducted in person, over the phone, through the mail, or online. A survey involves asking a standard set of questions to a group of subjects. 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." This is known as the **Likert Scale**. Surveys are commonly used by sociologists, marketing researchers, political scientists, therapists, and others to gather information on many independent and dependent variables in a relatively short period of time. Surveys typically yield surface information on a wide variety of factors, but may not allow for in-depth understanding of human behavior.

Of course, surveys can be designed in a number of ways. They may include forced choice questions and semi-structured questions in which the researcher allows the respondent to describe or give details about certain events. One of the most difficult aspects of designing a good survey is wording questions in an unbiased way and asking the right questions so that respondents can give a clear response rather than choosing "undecided" each time. Knowing that 30% of respondents are undecided is of little use! So a lot of time and effort should be placed on the construction of survey items. 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. Analysis takes much longer when respondents give lengthy responses that must be analyzed in a different way. Surveys are useful in examining stated values, attitudes, opinions, and reporting on practices. However, they are based on self-report or what people say they do rather than on observation and this can limit accuracy.

Developmental Designs

Developmental designs are techniques used in developmental research (and other areas as well). These techniques try to examine how age, cohort, gender, and social class impact development.

Longitudinal Research

Longitudinal research involves beginning with a group of people who may be of the same age and background 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 them when they were younger.

Figure 1.4.2: A longitudinal research design. (Image by NOBA is licensed under CC BY-NC-SA 4.0)

A problem with this type of research is that it is very expensive and subjects may drop out over time. The Perry Preschool Project which began in 1962 is an example of a longitudinal study that continues to provide data on children's development.

Cross-sectional Research

Cross-sectional research involves beginning with a sample that represents a cross-section of the population. Respondents who vary in age, gender, ethnicity, and social class might be asked to complete a survey about television program preferences or attitudes toward the use of the Internet. The attitudes of males and females could then be compared, as could attitudes based on age. In cross-sectional research, respondents are measured only once.

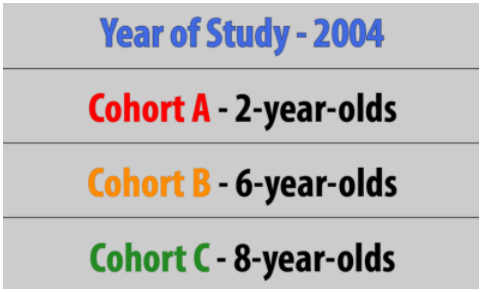

Figure 1.4.3: A cross-sectional research design. (Image by NOBA is licensed under CC BY-NC-SA 4.0)

This method is much less expensive than longitudinal research but does not allow the researcher to distinguish between the impact of age and the cohort effect. Different attitudes about the use of technology, for example, might not be altered by a person's biological age as much as their life experiences as members of a cohort.

Sequential Research

Sequential research involves combining aspects of the previous two techniques; beginning with a cross-sectional sample and measuring them through time.

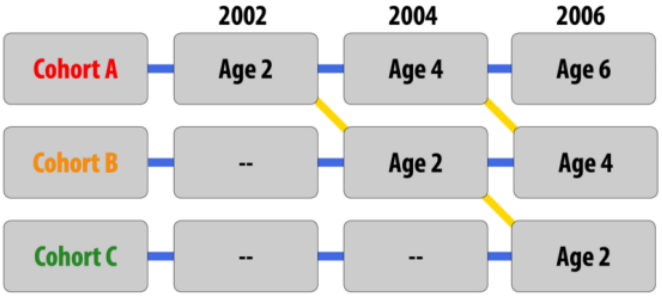

Figure 1.4.4: A sequential research design. (Image by NOBA is licensed under CC BY-NC-SA 4.0)

This is the perfect model for looking at age, gender, social class, and ethnicity. But the drawbacks of high costs and attrition are here as well.16

Table 1.4.1: Advantages and Disadvantages of Different Research Designs (Research Methods in Developmental Psychology by Angela Lukowski and Helen Milojevich is licensed under a CC BY-NC-SA 4.0)

Type of Research Design	Advantages	Disadvantages
Longitudinal	• Examines changes within individuals over time • Provides a developmental analysis	• Expensive • Takes a long time • Participant attrition • Possibility of practice effects • Cannot examine cohort effects
Cross-sectional	• Examines changes between participants of different ages at the same point in time • Provides information on age-related change	• Cannot examine change over time • Cannot examine cohort effects
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	• May be expensive • Possibility of practice effects

Consent and Ethics in Research

Research should, as much as possible, be based on participants' freely volunteered informed consent. For minors, this also requires consent from their legal guardians. This implies a responsibility to explain fully and meaningfully to both the child and their guardians what the research is about and how it will be disseminated. Participants and their legal guardians should be aware of the research purpose and procedures, their right to refuse to participate; the extent to which confidentiality will be maintained; the potential uses to which the data might be put; the foreseeable risks and expected benefits; and that participants have the right to discontinue at any time.

But consent alone does not absolve the responsibility of researchers to anticipate and guard against potentially harmful consequences for participants.18 It is critical that researchers protect all rights of the participants including confidentiality.

Child development is a fascinating field of study – but care must be taken to ensure that researchers use appropriate methods to examine infant and child 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. Hopefully, this information helped you develop an understanding of these various issues and to be ready to think more critically about research questions that interest you. There are so many interesting questions that remain to be examined by future generations of developmental scientists – maybe you will make one of the next big discoveries!19

Another really important framework to use when trying to understand children's development are theories of development. Let's explore what theories are and introduce you to some major theories in child development.

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1.5: Developmental Theories

What is a Theory?

Students sometimes feel intimidated by theory; even the phrase, “Now we are going to look at some theories...” is met with blank stares and other indications that the audience is now lost. But theories are valuable tools for understanding human behavior; in fact, they are proposed explanations for the “how” and “whys” of development. Have you ever wondered, “Why is my three year old so inquisitive?” or “Why are some fifth graders rejected by their classmates?” Theories can help explain these and other occurrences. Developmental theories offer explanations about how we develop, why we change over time and the kinds of influences that impact development.

A **theory** guides and helps us interpret research findings as well. It provides the researcher with a blueprint or model to be used to help piece together various studies. Think of theories as guidelines much like directions that come with an appliance or other object that requires assembly. The instructions can help one piece together smaller parts more easily than if trial and error are used.

Theories can be developed using induction in which a number of single cases are observed and after patterns or similarities are noted, the theorist develops ideas based on these examples. Established theories are then tested through research; however, not all theories are equally suited to scientific investigation. Some theories are difficult to test but are still useful in stimulating debate or providing concepts that have practical application. Keep in mind that theories are not facts; they are guidelines for investigation and practice, and they gain credibility through research that fails to disprove them.20

Let’s take a look at some key theories in Child Development.

Sigmund Freud’s Psychosexual 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.

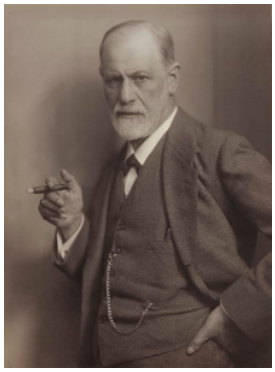

Figure 1.5.1: Sigmund Freud. (Image is in the public domain)

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 not progress to the next stage. Here is a brief introduction to Freud's stages.

Table 1.5.1: Sigmund Freud's Psychosexual Theory

Name of Stage	Descriptions of Stage
Oral Stage	The **oral stage** lasts from birth until around age 2. The infant is all id. At this stage, all stimulation and comfort is focused on the mouth and is based on the reflex of sucking. Too much indulgence or too little stimulation may lead to fixation.
Anal Stage	The **anal stage** coincides with potty training or learning to manage biological urges. The ego is beginning to develop in this stage. Anal fixation may result in a person who is compulsively clean and organized or one who is sloppy and lacks self-control.
Phallic Stage	The **phallic stage** occurs in early childhood and marks the development of the superego and a sense of masculinity or femininity as culture dictates.
Latency	**Latency** occurs during middle childhood when a child's urges quiet down and friendships become the focus. The ego and superego can be refined as the child learns how to cooperate and negotiate with others.
Genital Stage	The **genital stage** begins with puberty and continues through adulthood. Now the preoccupation is that of sex and reproduction.

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 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 is 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 Freud's views.22

Main Points to Note About Freud's Psychosexual Theory

Freud believed that:

- Development in the early years has a lasting impact.
- There are three parts of the self: the id, the ego, and the superego
- People go through five stages of psychosexual development: the oral stage, the anal stage, the phallic stage, latency, and the genital stage

We study Freud because his assumptions the importance of early childhood experience provide a framework for later theories (the both elaborated and contradicted/challenged his work).

Erik Erikson's Psychosocial Theory

Now, let's turn to a less controversial theorist, Erik Erikson. Erikson (1902-1994) suggested that our relationships and society's expectations motivate much of our behavior in his theory of psychosocial development. Erikson was a student of Freud's but emphasized the importance of the ego, or conscious thought, in determining our actions. In other words, he believed that we are not driven by unconscious urges. We know what motivates us and we consciously think about how to achieve our goals. He is considered the father of developmental psychology because his model gives us a guideline for the entire life span and suggests certain primary psychological and social concerns throughout life.

Figure 1.5.2: Erik Erikson. (Image is in the public domain)

Erikson expanded on his Freud's by emphasizing the importance of culture in parenting practices and motivations and adding three stages of adult development (Erikson, 1950; 1968).

He believed that we are aware of what motivates us throughout life and the ego has greater importance in guiding our actions than does the id. We make conscious choices in life and these choices focus on meeting certain social and cultural needs rather than purely biological ones. Humans are motivated, for instance, by the need to feel that the world is a trustworthy place, that we are capable individuals, that we can make a contribution to society, and that we have lived a meaningful life. These are all psychosocial problems.

Erikson divided the lifespan into eight stages. In each stage, we have a major psychosocial task to accomplish or crisis to overcome. Erikson believed that our personality continues to take shape throughout our lifespan as we face these challenges in living. Here is a brief overview of the eight stages:

Table 1.5.2: Erik Erikson's Psychosocial Theory

Name of Stage	Description of Stage
Trust vs. mistrust (0-1)	The infant must have basic needs met in a consistent way in order to feel that the world is a trustworthy place.
Autonomy vs. shame and doubt (1-2)	Mobile toddlers have newfound freedom they like to exercise and by being allowed to do so, they learn some basic independence.
Initiative vs. Guilt (3-5)	Preschoolers like to initiate activities and emphasize doing things "all by myself."
Industry vs. inferiority (6- 11)	School aged children focus on accomplishments and begin making comparisons between themselves and their classmates
Identity vs. role confusion (adolescence)	Teenagers are trying to gain a sense of identity as they experiment with various roles, beliefs, and ideas.
Intimacy vs. Isolation (young adulthood)	In our 20s and 30s we are making some of our first long-term commitments in intimate relationships.
Generativity vs. stagnation (middle adulthood)	The 40s through the early 60s we focus on being productive at work and home and are motivated by wanting to feel that we've made a contribution to society.
Integrity vs. Despair (late adulthood)	We look back on our lives and hope to like what we see-that we have lived well and have a sense of integrity because we lived according to our beliefs.

These eight stages form a foundation for discussions on emotional and social development during the life span. Keep in mind, however, that these stages or crises can occur more than once. For instance, a person may struggle with a lack of trust beyond infancy under certain circumstances. Erikson's theory has been 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 that are 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.24

Main Points to Note About Erikson's Psychosocial Theory

Erikson was a student of Freud but focused on conscious thought.

- His stages of psychosocial development address the entire lifespan and suggest primary psychosocial crisis in some cultures that adults can use to understand how to support children's social and emotional development.
- The stages include: trust vs. mistrust, autonomy vs. shame and doubt, initiative vs. guilt, industry vs. inferiority, identity vs. role confusion, intimacy vs. isolation, generativity vs. stagnation, and integrity vs. despair.

Behaviorism

While Freud and Erikson looked at what was going on in the mind, 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.25

Ivan Pavlov

Ivan Pavlov (1880-1937) was a Russian physiologist interested in studying digestion. As he recorded the amount of salivation his laboratory dogs produced as they ate, he noticed that they actually began to salivate before the food arrived as the researcher walked down the hall and toward the cage. "This," he thought, "is not natural!" One would expect a dog to automatically salivate when food hit their palate, but BEFORE the food comes? Of course, what had happened was . . . you tell me. That's right! The dogs knew that the food was coming because they had learned to associate the footsteps with the food. The key word here is "learned". A learned response is called a "conditioned" response.

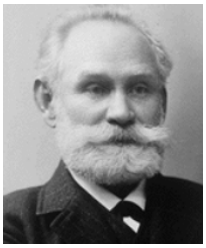

Figure 1.5.3: Ivan Pavlov. (Image is in the public domain)

Pavlov began to experiment with this concept of **classical conditioning**. He began to ring a bell, for instance, prior to introducing the food. Sure enough, after making this connection several times, the dogs could be made to salivate to the sound of a bell. Once the bell had become an event to which the dogs had learned to salivate, it was called a **conditioned stimulus**. The act of salivating to a bell was a response that had also been learned, now termed in Pavlov's jargon, a conditioned response. Notice that the response, salivation, is the same whether it is conditioned or unconditioned (unlearned or natural). What changed is the stimulus to which the dog salivates. One is natural (unconditioned) and one is learned (conditioned).

Let's think about how classical conditioning is used on us. One of the most widespread applications of classical conditioning principles was brought to us by the psychologist, John B. Watson.

John B. Watson

John B. Watson (1878-1958) believed that most of our fears and other emotional responses are classically conditioned. He had gained a good deal of popularity in the 1920s with his expert advice on parenting offered to the public.

Figure 1.5.4: John B. Watson. (Image is in the public domain)

He tried to demonstrate the power of classical conditioning with his famous experiment with an 18-month-old boy named "Little Albert". Watson sat Albert down and introduced a variety of seemingly scary objects to him: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear

of loud noises so he proceeded to make a loud noise each time he introduced one of Albert's favorites, a white rat. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced. Watson filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow his advice. Watson wrote columns in newspapers and in magazines and gained a lot of popularity among parents eager to apply science to household order.

Operant conditioning, on the other hand, looks at the way the consequences of a behavior increase or decrease the likelihood of a behavior occurring again. So let's look at this a bit more.

B.F. Skinner and Operant Conditioning

B. F. Skinner (1904-1990), who brought us the principles of operant conditioning, suggested that reinforcement is a more effective means of encouraging a behavior than is criticism or punishment. By focusing on strengthening desirable behavior, we have a greater impact than if we emphasize what is undesirable. Reinforcement is anything that an organism desires and is motivated to obtain.

Figure 1.5.5: B. F. Skinner. (Image is in the public domain)

A **reinforcer** is something that encourages or promotes a behavior. Some things are natural rewards. They are considered intrinsic or primary because their value is easily understood. Think of what kinds of things babies or animals such as puppies find rewarding.

Extrinsic or secondary reinforcers are things that have a value not immediately understood. Their value is indirect. They can be traded in for what is ultimately desired.

The use of **positive reinforcement** involves adding something to a situation in order to encourage a behavior. For example, if I give a child a cookie for cleaning a room, the addition of the cookie makes cleaning more likely in the future. Think of ways in which you positively reinforce others.

Negative reinforcement occurs when taking something unpleasant away from a situation encourages behavior. For example, I have an alarm clock that makes a very unpleasant, loud sound when it goes off in the morning. As a result, I get up and turn it off. By removing the noise, I am reinforced for getting up. How do you negatively reinforce others?

Punishment is an effort to stop a behavior. It means to follow an action with something unpleasant or painful. Punishment is often less effective than reinforcement for several reasons. It doesn't indicate the desired behavior, it may result in suppressing rather than stopping a behavior, (in other words, the person may not do what is being punished when you're around, but may do it often when you leave), and a focus on punishment can result in not noticing when the person does well. Not all behaviors are learned through association or reinforcement. Many of the things we do are learned by watching others. This is addressed in social learning theory.

Social Learning Theory

Albert Bandura (1925-) is a leading contributor to social learning theory. He calls our attention to the ways in which many of our actions are not learned through conditioning; rather, they are learned by watching others (1977). Young children frequently learn behaviors through imitation

Figure 1.5.6: Albert Bandura. (Image by Albert Bandura is licensed under CC BY-SA 4.0)

Sometimes, particularly when we do not know what else to do, we learn by modeling or copying the behavior of others. A kindergartner on his or her first day of school might eagerly look at how others are acting and try to act the same way to fit in more quickly. Adolescents struggling with their identity rely heavily on their peers to act as role-models. Sometimes we do things because we've seen it pay off for someone else. They were operantly conditioned, but we engage in the behavior because we hope it will pay off for us as well. This is referred to as vicarious reinforcement (Bandura, Ross and Ross, 1963).

Bandura (1986) suggests that there is interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. Parents not only influence their child's environment, perhaps intentionally through the use of reinforcement, etc., but children influence parents as well. Parents may respond differently with their first child than with their fourth. Perhaps they try to be the perfect parents with their firstborn, but by the time their last child comes along they have very different expectations both of themselves and their child. Our environment creates us and we create our environment.30

Bandura and the Bobo Doll Experiment & Today's Children and the Media

Other social influences: TV or not TV? Bandura (et als. 1963) began a series of studies to look at the impact of television, particularly commercials, on the behavior of children. Are children more likely to act out aggressively when they see this behavior modeled? What if they see it being reinforced? Bandura began by conducting an experiment in which he showed children a film of a woman hitting an inflatable clown or "bobo" doll. Then the children were allowed in the room where they found the doll and immediately began to hit it. This was without any reinforcement whatsoever. Not only that, but they found new ways to behave aggressively. It's as if they learned an aggressive role.

Children view far more television today than in the 1960s; so much, in fact, that they have been referred to as Generation M (media). The amount of screen time varies by age. As of 2017, children 0-8 spend an average of 2 hours and 19 minutes. Children 8-12 years of age spend almost 6 hours a day on screen media. And 13- to 18-year-olds spend an average of just under 9 hours a day in entertainment media use.

The prevalence of violence, sexual content, and messages promoting foods high in fat and sugar in the media are certainly cause for concern and the subjects of ongoing research and policy review. Many children spend even more time on the computer viewing content from the internet. The amount of time spent connected to the internet continues to increase with the use of smartphones that essentially serve as mini-computers. And the ways children and adolescents interact with the media continues to change. The popularity of YouTube and the various social media platforms are examples of this. What might be the implications of this?31

Main Points to Note About Behaviorism

Behaviorists look at observable behavior and how it can be predicted and controlled.

- Pavlov experimented with classical conditioning, the process of conditioning a response to stimulus (the dog's salivating to the bell).
- Watson offered advice to parents to show them how classical conditioning can be used. His most famous experiment was conditioning Little Albert to fear a white rate.
- Skinner believed that reinforcing behavior is the most effective way of increasing desirable behavior. This is done through operant conditioning.
- Bandura noted that many behaviors are not learned through any type of conditioning, but rather through imitation. And he believed that people are not only influenced by their surroundings, but that they also have an impact on their surroundings.

Theories also explore cognitive development and how mental processes change over time.

Jean Piaget's Theory of Cognitive Development

Jean Piaget (1896-1980) is one of the most influential cognitive theorists. Piaget was inspired to explore children's ability to think and reason by watching his own children's development. He was one of the first to recognize and map out the ways in which children's thought differs from that of adults. His interest in this area began when he was asked to test the IQ of children and began to notice that there was a pattern in their wrong answers. He believed that children's intellectual skills change over time through maturation. Children of differing ages interpret the world differently.

Figure 1.5.7: Jean Piaget. (Image is in the public domain)

Piaget believed our desire to understand the world comes from a need for cognitive **equilibrium**. This is an agreement or balance between what we sense in the outside world and what we know in our minds. If we experience something that we cannot understand, we try to restore the balance by either changing our thoughts or by altering the experience to fit into what we do understand. Perhaps you meet someone who is very different from anyone you know. How do you make sense of this person? You might use them to establish a new category of people in your mind or you might think about how they are similar to someone else.

A **schema** or schemes are categories of knowledge. They are like mental boxes of concepts. A child has to learn many concepts. They may have a scheme for "under" and "soft" or "running" and "sour". All of these are schema. Our efforts to understand the world around us lead us to develop new schema and to modify old ones.

One way to make sense of new experiences is to focus on how they are similar to what we already know. This is **assimilation**. So the person we meet who is very different may be understood as being "sort of like my brother" or "his voice sounds a lot like yours." Or a new food may be assimilated when we determine that it tastes like chicken!

Another way to make sense of the world is to change our mind. We can make a cognitive accommodation to this new experience by adding new schema. This food is unlike anything I've tasted before. I now have a new category of foods that are bitter-sweet in flavor, for instance. This is **accommodation**. Do you accommodate or assimilate more frequently? Children accommodate more frequently as they build new schema. Adults tend to look for similarity in their experience and assimilate. They may be less inclined to think "outside the box." Piaget suggested different ways of understanding that are associated with maturation. He divided this into four stages:

Table 1.5.3: Jean Piaget's Theory of Cognitive Development

Name of Stage	Description of Stage
Sensorimotor Stage	During the **sensorimotor stage** children rely on use of the senses and motor skills. From birth until about age 2, the infant knows by tasting, smelling, touching, hearing, and moving objects around. This is a real hands on type of knowledge.
Preoperational Stage	In the **preoperational stage**, children from ages 2 to 7, become able to think about the world using symbols. A **symbol** is something that stands for something else. The use of language, whether it is in the form of words or gestures, facilitates knowing and communicating about the world. This is the hallmark of preoperational intelligence and occurs in early childhood. However, these children are preoperational or pre-logical. They still do not understand how the physical world operates. They may, for instance, fear that they will go down the drain if they sit at the front of the bathtub, even though they are too big.
Concrete Operational	Children in the **concrete operational** stage, ages 7 to 11, develop the ability to think logically about the physical world. Middle childhood is a time of understanding concepts such as size, distance, and constancy of matter, and cause and effect relationships. A child knows that a scrambled egg is still an egg and that 8 ounces of water is still 8 ounces no matter what shape of glass contains it.

Name of Stage	Description of Stage
Formal Operational	During the **formal operational** stage children, at about age 12, acquire the ability to think logically about concrete and abstract events. The teenager who has reached this stage is able to consider possibilities and to contemplate ideas about situations that have never been directly encountered. More abstract understanding of religious ideas or morals or ethics and abstract principles such as freedom and dignity can be considered.

Criticisms of Piaget's Theory

Piaget has been criticized for overemphasizing the role that physical maturation plays in cognitive development and in underestimating the role that culture and interaction (or experience) plays in cognitive development. Looking across cultures reveals considerable variation in what children are able to do at various ages. Piaget may have underestimated what children are capable of given the right circumstances.33

Main Points To Note About Piaget's Theory of Cognitive Development

Piaget, one of the most influential cognitive theorists, believed that

- Understanding is motivated by trying to balance what we sense in the world and what we know in our minds.
- Understanding is organized through creating categories of knowledge. When presented with new knowledge we may add new schema or modify existing ones.

Children's understanding of the world of the world changes are their cognitive skills mature through four stages: sensorimotor stage, preoperational stage, concreate operational stage, and formal operational stage.

Lev Vygotsky's Sociocultural Theory

Lev Vygotsky (1896-1934) was a Russian psychologist who wrote in the early 1900s but whose work was discovered in the United States in the 1960s but became more widely known in the 1980s. Vygotsky differed with Piaget in that he believed that a person not only has a set of abilities, but also a set of potential abilities that can be realized if given the proper guidance from others. His sociocultural theory emphasizes the importance of culture and interaction in the development of cognitive abilities. He believed that through guided participation known as scaffolding, with a teacher or capable peer, a child can learn cognitive skills within a certain range known as the **zone of proximal development**.34 His belief was that development occurred first through children's immediate social interactions, and then moved to the individual level as they began to internalize their learning.35

Figure 1.5.8: Lev Vygotsky. (Image by The Vigotsky Project is licensed under CC BY-SA 3.0)

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 all through the process. You gave them assistance when they seemed to need it, but once they knew what to do-you stood back and let them go. This is **scaffolding** and can be seen demonstrated throughout the world. This approach to teaching has also been adopted by educators. 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. You can see how Vygotsky would be very popular with modern day educators.37

Main Points to Note About Vygotsky's Sociocultural Theory

Vygotsky concentrated on the child's interactions with peers and adults. He believed that the child was an apprentice, learning through sensitive social interactions with more skilled peers and adults.

Comparing Piaget and Vygotsky

Vygotsky concentrated more on the child's immediate social and cultural environment and his or her interactions with adults and peers. While Piaget saw the child as actively discovering the world through individual interactions with it, Vygotsky saw the child as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities.38

Like Vygotsky's, Bronfenbrenner looked at the social influences on learning and development.

Urie Bronfenbrenner's Ecological Systems Model

Urie Bronfenbrenner (1917-2005) offers us one of the most comprehensive theories of human development. Bronfenbrenner studied Freud, Erikson, Piaget, and learning theorists and believed that all of those theories could be enhanced by adding the dimension of context. What is being taught and how society interprets situations depends on who is involved in the life of a child and on when and where a child lives.

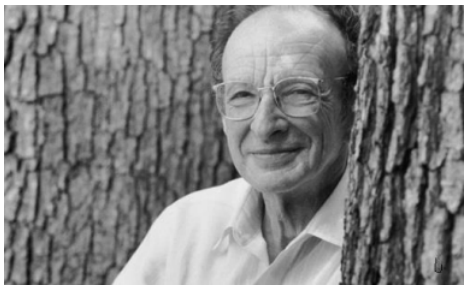

Figure 1.5.9: Urie Bronfenbrenner. (Image by Marco Vicente González is licensed under CC BY-SA 4.0)

Bronfenbrenner's ecological systems model explains the direct and indirect influences on an individual's development.

Table 1.5.4: Urie Bronfenbrenner's Ecological Systems Model

Name of System	Description of System
Microsystems	**Microsystems** impact a child directly. These are the people with whom the child interacts such as parents, peers, and teachers. The relationship between individuals and those around them need to be considered. For example, to appreciate what is going on with a student in math, the relationship between the student and teacher should be known.
Mesosystems	**Mesosystems** are interactions between those surrounding the individual. The relationship between parents and schools, for example will indirectly affect the child.
Exosystem	Larger institutions such as the mass media or the healthcare system are referred to as the **exosystem**. These have an impact on families and peers and schools who operate under policies and regulations found in these institutions.
Macrosystems	We find cultural values and beliefs at the level of **macrosystems**. These larger ideals and expectations inform institutions that will ultimately impact the individual.
Chronosystem	All of this happens in an historical context referred to as the **chronosystem**. Cultural values change over time, as do policies of educational institutions or governments in certain political climates. Development occurs at a point in time.

For example, in order to understand a student in math, we can't simply look at that individual and what challenges they face directly with the subject. We have to look at the interactions that occur between teacher and child. Perhaps the teacher needs to

make modifications as well. The teacher may be responding to regulations made by the school, such as new expectations for students in math or constraints on time that interfere with the teacher's ability to instruct. These new demands may be a response to national efforts to promote math and science deemed important by political leaders in response to relations with other countries at a particular time in history.

Figure 1.5.10: Bronfenbrenner's ecological systems theory. (Image by Ian Joslin is licensed under CC BY 4.0)

Bronfenbrenner's ecological systems model challenges us to go beyond the individual if we want to understand human development and promote improvements.41

Main Points to Note About Bronfenbrenner's Ecological Model

After studying all of the prior theories, Bronfenbrenner added an important element of context to the discussion of influences on human development.

- He believed that the people involved in children's lives and when and where they live are important considerations.
- He created a model of nested systems that influence the child (and are influenced by the child) that include: microsystems, mesosystems, the exosystem, macrosystems, and chronosystems.

Contributors and Attributions

Rasmussen, Eric (2017, Oct 19). *Screen Time and Kids: Insights from a New Report*. Retrieved from https://www.pbs.org/parents/thrive/screen-time-and-kids-insights-from-a-new-report

38. Children's Development by Ana R. Leon is licensed under CC BY 4.0

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1.S: Summary

In this chapter we looked at:

- underlying principles of development
- the five periods of development
- three issues in development
- Various methods of research
- important theories that help us understand development

Next, we are going to be examining where we all started with conception, heredity, and prenatal development.

2: CONCEPTION, HEREDITY, AND PRENATAL DEVELOPMENT

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College of the Canyons

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CHAPTER OVERVIEW

2: Conception, Heredity, and Prenatal Development

Learning Objectives

After this chapter, you should be able to:

1. Evaluate roles of nature and nurture in development.
2. Define genes and chromosomes.
3. Differentiate mitosis and meiosis.
4. Explain dominant and recessive patterns on inheritance.
5. List common genetic disorders and chromosomal abnormalities.
6. Describe changes that occur within each of the three periods of prenatal development.
7. Recognize the risks to prenatal development posed by exposure to teratogens.
8. Evaluate different types of prenatal assessment.

In this chapter, we will begin by examining some of the ways in which heredity helps to shape the way we are. We will look at what happens genetically during conception, and describe some known genetic and chromosomal disorders. Next we will consider what happens during prenatal development, including the impact of teratogens. We will also discuss the impact that both the mother and father have on the developing fetus.

2.1: Heredity

Nature and Nurture

Most scholars agree that there is a constant interplay between nature (heredity) and nurture (the environment). It is difficult to isolate the root of any single characteristic 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's 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 determine whether or not they actually develop the disease.

This bidirectional interplay between nature and nurture is the **epigenetic framework**, which suggests that the environment can affect the expression of genes just as genetic predispositions can impact a person's potentials. And environmental circumstances can trigger symptoms of a genetic disorder.2

Environment Correlations

Environment Correlations refer to the processes by which genetic factors contribute to variations in the environment (Plomin, DeFries, Knopik, & Neiderhiser, 2013). There are three types of genotype-environment correlations:

Passive genotype-environment correlation occurs when children passively inherit the genes and the environments their family provides. Certain behavioral characteristics, such as being athletically inclined, may run in families. The children have inherited both the genes that would enable success at these activities, and given the environmental encouragement to engage in these actions.

Figure 2.1.1: Two skiers. (Image by Alexey Ruban on Unsplash)

Evocative genotype-environment correlation refers to how the social environment reacts to individuals based on their inherited characteristics. For example, whether one has a more outgoing or shy temperament will affect how he or she is treated by others.

Active genotype-environment correlation occurs when individuals seek out environments that support their genetic tendencies. This is also referred to as niche picking. For example, children who are musically inclined seek out music instruction and opportunities that facilitate their natural musical ability.

Conversely, **Genotype-Environment Interactions** involve genetic susceptibility to the environment. Adoption studies provide evidence for genotype-environment interactions. For example, the Early Growth and Development Study (Leve, Neiderhiser, Scaramella, & Reiss, 2010) followed 360 adopted children and their adopted and biological parents in a longitudinal study. Results have shown that children whose biological parents exhibited psychopathology, exhibited significantly fewer behavior problems when their adoptive parents used more structured parenting than unstructured. Additionally, elevated psychopathology in adoptive parents increased the risk for the children's development of behavior problems, but only when the biological parents' psychopathology was high. Consequently, the results show how environmental effects on behavior differ based on the genotype, especially stressful environments on genetically at-risk children. 4

Genes and Chromosomes

Now, let's look more closely at just nature. Nature refers to the contribution of genetics to one's development. The basic building block of the nature perspective is the gene. **Genes** are recipes for making proteins, while proteins influence the structure and functions of cells. Genes are located on the chromosomes and there are an estimated 20,500 genes for humans, according to the Human Genome Project (NIH, 2015).

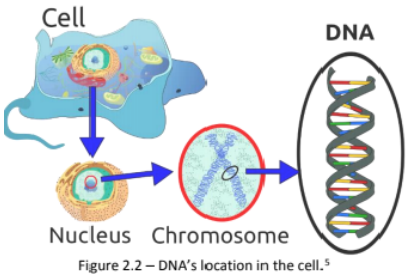

Figure 2.2 – DNA's location in the cell.[5]

Figure 2.1.2: DNA's location in the cell. (Image by Radio89 is licensed under CC BY-SA 3.0)

Normal human cells contain 46 chromosomes (or 23 pairs; one from each parent) in the nucleus of the cells. After conception, most cells of the body are created by a process called mitosis. **Mitosis** is defined as the cell's nucleus making an exact copy of all the chromosomes and splitting into two new cells.

However, the cells used in sexual reproduction, called the gametes (sperm or ova), are formed in a process called meiosis. In meiosis, the gamete's chromosomes duplicate, and then divide twice resulting in four cells containing only half the genetic material of the original gamete. Thus, each sperm and egg possesses only 23 chromosomes and combine to produce the normal 46.

Table 2.1 - Mitosis & Meiosis

Type of Cell Division	Explanation	Steps
Mitosis	All cells, except those used in sexual reproduction, are created by mitosis	Step 1. Chromosomes make a duplicate copy Step 2. Two identical cells are created
Meiosis	Cells used in sexual reproduction are created by meiosis	Step 1. Exchange of gene between the chromosomes (crossing over) Step 2. Chromosomes make a duplicate Step 3. First cell division Step 4. Second cell division

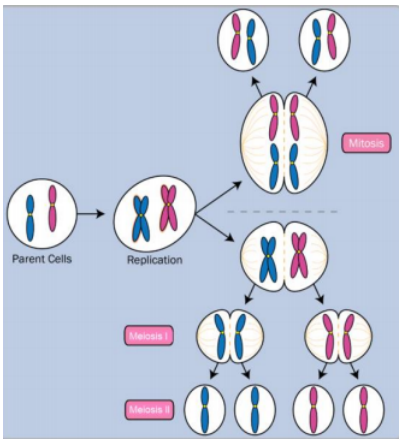

Figure 2.1.3: Mitosis and Meiosis. (Image by Community College Consortium for Bioscience Credentials is licensed under CC BY 3.0)

Given the amount of genes present and the unpredictability of the meiosis process, the likelihood of having offspring that are genetically identical (and not twins) is one in trillions (Gould & Keeton, 1997).

Of the 23 pairs of chromosomes created at conception, 22 pairs are similar in length. These are called **autosomes**. The remaining pair, or **sex chromosomes**, may differ in length. If a child receives the combination of XY, the child will be genetically male. If the child receives the combination XX, the child will be genetically female.8

Here is an image (called a karyogram) of what the 23 pairs of chromosomes look like. Notice the differences between the sex chromosomes in female (XX) and male (XY).

Figure 2.1.4: The 23 pairs of chromosomes. (Image by Nami-ja is in the public domain)

Genotypes and Phenotypes & Patterns on Inheritance

The word **genotype** refers to the sum total of all the genes a person inherits. The word **phenotype** refers to the features that are actually expressed. Look in the mirror. What do you see, your genotype or your phenotype? What determines whether or not genes are expressed? Because genes are inherited in pairs on the chromosomes, we may receive either the same version of a gene from our mother and father, that is, be **homozygous** for that characteristic the gene influences. If we receive a different version of the gene from each parent, that is referred to as **heterozygous**.

In the homozygous situation we will display that characteristic. It is in the heterozygous condition that it becomes clear that not all genes are created equal. Some genes are **dominant**, meaning they express themselves in the phenotype even when paired with a different version of the gene, while their silent partner is called recessive. **Recessive** genes express themselves only when paired with a similar version gene. Geneticists refer to different versions of a gene as alleles. Some dominant traits include having facial dimples, curly hair, normal vision, and dark hair. Some recessive traits include red hair, being nearsighted, and straight hair.

Most characteristics are not the result of a single gene; they are **polygenic**, meaning they are the result of several genes. In addition, the dominant and recessive patterns described above are usually not that simple either. Sometimes the dominant gene does not completely suppress the recessive gene; this is called incomplete dominance. 10

Genetic Disorders

Most of the known **genetic disorders** are dominant gene-linked; however, the vast majority of dominant gene linked disorders are not serious or debilitating. For example, the majority of those with Tourette's Syndrome suffer only minor tics from time to time and can easily control their symptoms. When dominant-gene linked diseases are serious, they do not tend to become symptomatic until later in life. Huntington's Disease is a dominant gene linked disorder that affects the nervous system and is fatal, but does not appear until midlife.

Recessive gene disorders, such as cystic fibrosis and sickle-cell anemia, are less common but may actually claim more lives because they are less likely to be detected as people are unaware that they are carriers of the disease.

Some genetic disorders are sex-linked; the defective gene is found on the X-chromosome. Males have only one X chromosome so are at greater risk for sex-linked disorders due to a recessive gene such as hemophilia, color-blindness, and baldness. For females to be affected by recessive genetic defects, they need to inherit the recessive gene on both X-chromosomes. But if the defective gene is dominant, females are equally at risk.

Here are tables of some genetic disorders:

Recessive Disorders (Homozygous): The individual inherits a gene change from both parents. If the gene is inherited from just one parent, the person is a carrier and does not have the condition.

Table 2.2 - Recessive Disorders (Homozygous)

Disorder	Description	Cases per Birth
Sickle Cell Disease (SCD)	A condition in which the red blood cells in the body are shaped like a sickle (like the letter C) and affect the ability of the blood to transport oxygen.	1 in 500 Black births 1 in 36,000 Hispanic births

Disorder	Description	Cases per Birth
Cystic Fibrosis (CF)	A condition that affects breathing and digestion due to thick mucus building up in the body, especially the lungs and digestive system. In CF, the mucus is thicker than normal and sticky.	1 in 3500
Phenylketonuria (PKU)	A metabolic disorder in which the individual cannot metabolize phenylalanine, an amino acid. Left untreated, intellectual deficits occur. PKU is easily detected and is treated with a special diet.	1 in 10,000
Tay Sachs Disease	Caused by an enzyme deficiency resulting in the accumulation of lipids in the nerves cells of the brain. This accumulation results in progressive damage to the cells and a decrease in cognitive and physical development. Death typically occurs by age five.	1 in 4000 1 in 30 American Jews is a carrier 1 in 20 French Canadians is a carrier
Albinism	When the individual lacks melanin and processes little to no pigment in the skin, hair, and eyes. Vision problems can also occur.	Fewer than 20,000 US cases per year

Autosomal Dominant Disorders (Heterozygous): In order to have the disorder, the individual only needs to inherit the gene change from one parent.

Table 2.3 - Autosomal Dominant Disorders (Heterozygous)

Disorder	Description	Cases per Birth
Huntington's Disease	A condition that affects the individual's nervous system. Nerve cells become damaged, causing various parts of the brain to deteriorate. The disease affects movement, behavior and cognition. It is fatal, and occurs at midlife.	1 in 10,000
Tourette Syndrome	A tic disorder which results in uncontrollable motor and vocal tics as well as body jerking	1 in 250
Achondroplasia	The most common form of disproportionate short stature. The individual has abnormal bone growth resulting in short stature, disproportionately short arms and legs, short fingers, a large head, and specific facial features.	1 in 15,000-40,000

Sex-Linked Disorders: When the X chromosome carries the mutated gene, the disorder is referred to as an X-linked disorder. Males are more affected than females because they possess only one X chromosome without an additional X chromosome to counter the harmful gene.

Table 2.4 - Sex-Linked Disorders

Disorder	Description	Cases per Birth
Fragile X Syndrome	Occurs when the body cannot make enough of a protein it needs for the brain to grow and problems with learning and behavior can occur. Fragile X syndrome is caused from an abnormality in the X chromosome, which then breaks. If a female has a fragile X, her second X chromosome usually is healthy, but males with fragile X don't have a second healthy X chromosome. This is why symptoms of Fragile X usually are more serious in males.	1 in 4000 males 1 in 8000 females
Hemophilia	Occurs when there are problems in blood clotting causing both internal and external bleeding.	1 in 10,000 males
Duchenne Muscular Dystrophy	A weakening of the muscles resulting in an inability to move, wasting away, and possible death.	1 in 3500 males

Chromosomal Abnormalities: A **chromosomal abnormality** occurs when a child inherits too many or two few chromosomes. The most common cause of chromosomal abnormalities is the age of the mother. As the mother ages, the ovum is more likely to suffer abnormalities due to longer term exposure to environmental factors. Consequently, some 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 mother's body. 14

Here is a table of some autosomal chromosomal disorders:

Autosomal Chromosome Disorders: The individual inherits too many or two few chromosomes.

Table 2.5 - Autosomal Chromosomal Disorders

Disorder	Description
Down Syndrome/Trisomy 21	Caused by an extra chromosome 21 and includes a combination of birth defects. Affected individuals have some degree of intellectual disability, characteristic facial features, often heart defects, and other health problems. The severity varies greatly among affected individuals.
Trisomy 9 Mosaicism	Caused by having an extra chromosome 9 in some cells. The severity of effects relates to the proportion of cells with extra chromosomes. The effects include fetal growth restriction resulting in low birth weight and multiple anomalies, including facial, cardiac, musculoskeletal, genital, kidney, and respiratory abnormalities.
Trisomy 13	Caused by an extra chromosome 13. Affected individuals have multiple birth defects and generally die in the first weeks or months of life.
Trisomy 18	Caused by an extra chromosome 18 and the affected individual also has multiple birth defects and early death.

Figure 2.1.5: Infant boy with Trisomy 9 Mosaicism. (Image by Ashley Onken used with permission)

Figure 2.1.6: Girl with XXX Syndrome. (Image is in the public domain)

When the abnormality is on 23rd pair, the result is a sex-linked chromosomal abnormality. This happens when a person has less than or more than two sex chromosomes. 18

Here is a table of some sex-linked chromosomal disorders:

Table 2.6 - Sex-Linked Chromosomal Disorders

Disorder	Description
Turner Syndrome (XO)	Caused when all or part of one of the X chromosomes is lost before or soon after conception due to a random event. The resulting zygote has an XO composition. Turner Syndrome affects cognitive functioning and sexual maturation in girls. Infertility and a short stature may be noted.
Klinefelter Syndrome (XXY)	Caused when an extra X chromosome is present in the cells of a male due to a random event. The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development. The male can have some breast development, infertility, and low levels of testosterone.
XYY Syndrome	Caused when an extra Y chromosome is present in the cells of a male. There are few symptoms. They may include being taller than average, acne, and an increased risk of learning problems. The person is generally otherwise normal, including normal fertility.
Triple X Syndrome (XXX)	Caused when an extra X chromosome is present in the cells of a female. It may result in being taller than average, learning difficulties, decreased muscle tone, seizures, and kidney problems.

Contributors and Attributions

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2.2: Prenatal Development

Now we turn our attention to prenatal development which is divided into three periods: The germinal period, the embryonic period, and the fetal period. The following is an overview of some of the changes that take place during each period.

The Germinal Period

The **germinal period** (about 14 days in length) lasts from **conception** to implantation of the fertilized egg in the lining of 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. It is typically fertilized in the top section of the fallopian tube and continues its journey to the uterus. As a result, a new cell is formed. This cell, containing the combined genetic information from both parents, is referred to as a **zygote**.

Figure 2.2.1: Sperm and ovum at conception. (Image is in the public domain)

During this time, the organism begins cell division through mitosis. After five days of mitosis, there are 100 cells, which is now called a blastocyst. The blastocyst consists of both an inner and an outer group of cells. The inner group of cells, or embryonic disk will become the embryo, while the outer group of cells, or trophoblast, becomes the support system that nourishes the developing organism. This stage ends when the blastocyst fully implants into the uterine wall (U.S. National Library of Medicine, 2015).

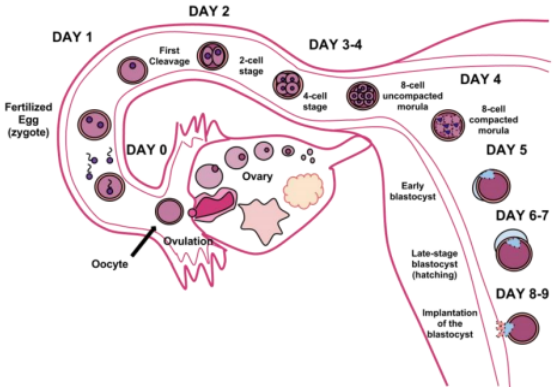

Figure 2.2.2: The cycle of fertilization. (Image by Ttrue12 is licensed under CC BY-SA 3.0)

Mitosis is a fragile process and fewer than one half of all zygotes survive beyond the first two weeks (Hall, 2004). Some of the reasons for this include: the egg and sperm do not join properly, thus their genetic material does not combine, there is too little or damaged genetic material, the zygote does not replicate, or the blastocyst does not implant into the uterine wall. The failure rate is higher for in vitro conceptions. The figure below illustrates the journey of the ova from its release to its fertilization, cell duplication, and implantation into the uterine lining. 22

The Embryonic Period

Starting the third week, the blastocyst has implanted in the uterine wall. 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**. Growth during prenatal development occurs in two major directions: from head to tail called **cephalocaudal development** and from the midline outward referred to as **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). You will see that this pattern continues after birth.

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. However, by the end of this stage they disappear and the organism takes on a more human appearance.

Figure 2.2.3: A human embryo. (Image by Anatomist90 is licensed under CC BY-SA 3.0)

About 20 percent of organisms fail during the embryonic period, usually due to gross chromosomal abnormalities, often before the mother even knows 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. Prospective mothers are not often aware of the risks they introduce to the developing embryo during this time. The embryo is approximately 1 inch in length and weighs about 4 grams at the end of eight weeks. The embryo can move and respond to touch at this time. 24

The Fetal Period

From the ninth week until birth (which is forty weeks for a full-term pregnancy), the organism is referred to as a **fetus**. During this stage, the major structures are continuing to develop. By the third month, the fetus has all its body parts including external genitalia. The fetus is about 3 inches long and weighs about 28 grams. In the following weeks, the fetus will develop hair, nails, teeth and the excretory and digestive systems will continue to develop.

Figure 2.2.4: A human fetus. (Image by lunar caustic is licensed under CC BY-SA 2.0)

During the 4th - 6th months, the eyes become more sensitive to light and hearing develops. The respiratory system continues to develop, and reflexes such as sucking, swallowing and hiccupping, develop during the 5th month. Cycles of sleep and wakefulness are present at this time as well. The first chance of survival outside the womb, known as the age of viability is reached at about 24 weeks (Morgan, Goldenberg, & Schulkin, 2008). Many practitioners hesitate to resuscitate before 24 weeks. 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).

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

At around 36 weeks the fetus is almost ready for birth. It weighs about 6 pounds and is about 18.5 inches long. 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. The progression through the stages is shown in the following figure. 26

Figure 2.2.5: The development of a fetus. (Image by CNX Psychology is licensed under CC BY 4.0)

Monozygotic and Dizygotic Twins

Monozygotic or identical twins occur when a fertilized egg splits apart in the first two weeks of development. The result is the creation of two separate, but genetically identical offspring. That is, they possess the same genotype and often the same phenotype. About one-third of twins are monozygotic twins.

Sometimes, however, two eggs or ova are released and fertilized by two separate sperm. The result is **dizygotic** or fraternal twins. These two individuals share the same amount of genetic material as would any two children from the same mother and father. In other words, they possess a different genotype and phenotype.

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. 28

Figure 2.2.6: Monozygotic Twins (Image is in the public domain)

Figure 2.2.7: Dizygotic Twins (Image by Jennifer Paris used with permission)

Teratogens

Good prenatal care is essential to protect against maternal and fetal/infant mortality and birth complications. The embryo and fetus 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 many mothers are unaware that they are pregnant. Today, we know many of the factors that can jeopardize the health of the developing child. The study of factors that contribute to birth defects is called teratology. **Teratogens** are environmental factors that can contribute to birth defects, and include some maternal diseases, pollutants, drugs and alcohol.

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, 2005). 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. (see figure below)
- **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.
- **The number of teratogens:** Fetuses exposed to multiple teratogens typically have more problems than those exposed to only one.
- **Genetics:** Genetic makeup also plays a role on the impact a particular teratogen might have on the child. This is suggested by fraternal twins exposed to the same prenatal environment, but they do not experience the same teratogenic effects. The genetic makeup 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. 31

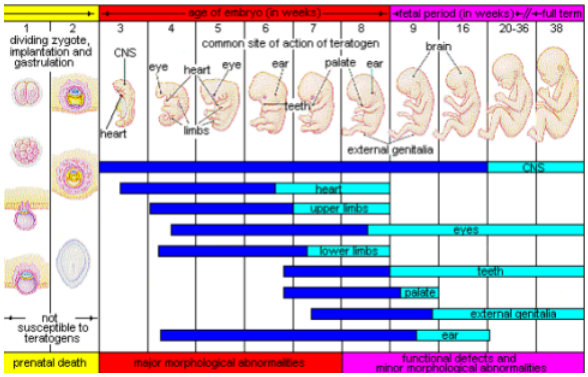

Figure 2.2.8: The development of an embryo into a fetus. (Image by Laura Overstreet is licensed under CC BY-NC-SA 3.0)

There are four categories of teratogens:

1. **Physical teratogens:** These could be saunas, hot tubs, or infections that raise a pregnant woman's body temperature to 102 degrees Fahrenheit or higher. This is associated with neural tube defects, spontaneous abortions, and various cardiovascular abnormalities.
2. **Metabolic conditions affecting pregnant females:** Metabolic conditions are abnormalities in the chemical process of producing energy from food, and thereby affect the development and function of the body. If a pregnant woman is

malnourished, then her fetus likely lacks the nutrients essential for its development. These include: malnutrition, diabetes, and thyroid disorders.

3. **Infections:** Different maternal infections, including rubella virus, herpes simplex virus, and syphilis can cause congenital abnormalities in fetuses.
4. **Drugs and chemicals:** When pregnant females ingest or absorb these, they may cause a variety of different effects based on specific agent, amount of exposure, and timing. This category includes: radiation, heavy metals (including lead), insecticides and herbicides, prescription and over the counter drugs, illicit and recreational drugs, alcohol, cigarettes, nicotine, caffeine, and even some vitamins. 33

While there are many, many potential teratogens, the following tables look at the effects of some different types of teratogens. The risks of exposure vary based on lifestyle and health. The effects may vary greatly depending on the factors mentioned previously. Protection and prevention will vary based on the method of exposure.

Table 2.7: Drugs as Teratogens

Teratogen	Potential Effects
Caffeine	Moderate amounts of caffeine (200 mg or around 12 ounces of coffee) appear to be safe during pregnancy. Some studies have shown a link between higher amounts of caffeine and miscarriage and preterm birth.34
Tobacco	Tobacco use has been associated with low birth weight, placenta previa, preterm delivery, fetal growth restriction, sudden infant death syndrome, cleft lip or palate, and later health problems (such as high blood pressure and diabetes). 35
Alcohol	There is no safe amount of alcohol a woman can drink while pregnant. Alcohol can slow down the baby's growth, affect the baby's brain, and cause birth defects, and may results in fetal alcohol spectrum disorder (FASD). The effects can be mild to severe. Children born with a severe form of FASD can have abnormal facial features, severe learning disabilities, behavioral problems, and other problems.36
Cocaine	Cocaine use has connected with low birth weight, stillbirths, spontaneous abortion, placental abruption, premature birth, miscarriage, and neonatal abstinence syndrome (fetal addiction leads the newborn to experiences withdrawal).37
Marijuana	No amount of marijuana has been proven safe to use during pregnancy. Heavy use has been associated with brain damage, premature birth, and stillbirth.38
Heroin	Using heroin during pregnancy can cause birth defects, placental abruption, premature birth, low birthweight, neonatal abstinence syndrome, still birth, and sudden infant death syndrome.39
Over-the-Counter (OTC) medication	Some OTC medications are safe to use during pregnancy and others may cause health problems during pregnancy. Pregnant women should consult their health care provider before using OTC medications.40
Prescription drugs	Some prescription drugs can cause birth defects that change the shape or function of one or more parts of the body that can affect overall health. Pregnant women should consult their health care provider before discontinuing or starting new medications.41
Herbal or dietary supplements	Except for some vitamins, little is known about using herbal or dietary supplements while pregnant. Most often there are no good studies to show if the herb can cause harm to you or your baby. Also, some herbs that are safe when used in small amounts as food might be harmful when used in large amounts as medicines.42

Table 2.8: Environmental Teratogens

Teratogen	Potential Effects
Lead	Exposure to high levels of lead before and during pregnancy can lead to high blood pressure, problems with fetal brain and nervous system development, premature birth, low birthweight, and miscarriage.43
Mercury	Exposure to mercury in the womb can cause brain damage and hearing and vision problems.44
Radiation	Exposure to radiation during pregnancy (especially between 2 and 18 weeks of pregnancy) can slow growth, cause birth defects, affect brain development, cause cancer, and cause miscarriage.45
Solvents	These chemicals include degreasers, paint thinners, stain and varnish removers, paints, and more Maternal inhalation of solvents can cause fetal exposure than may cause miscarriage, slow fetal growth, premature birth, and birth defects.46

Table 2.9: Maternal Infections as Teratogens

Teratogen	Potential Effects
Rubella	Congenital infection (becoming infected while in the womb) can damage the development of the eyes, ears, heart, and brain and result in deafness.47
Zika	Congenital infection can cause microcephaly and other severe brain abnormalities. 48
Varicella (chicken pox)	Congenital infection can cause a severe form of the infection affecting the eyes, limbs, skin, and central nervous system.49
Sexually transmitted infections	Infections such as HIV, gonorrhea, syphilis, and chlamydia can be passed from the mother during pregnancy and/or delivery.50
Listeria	Pregnant women are more susceptible to this food-borne illness. Congenital infection can cause miscarriage, stillbirth, premature labor, and neonatal sepsis. 51

Table 2.10: Teratogens from Animals/Pets

Teratogen	Potential Effects
Toxoplamosis	This parasite can be passed through cat feces and undercooked meat (especially pork, lamb, or deer meet). If the fetus is infected it can cause miscarriage, stillbirth, hydrocephalus, macro or microcephalus, vision issues, and damage to the nervous system.52
Lymphocytic choriomeningitis	This virus carried by rodents including mice, hamsters, and guinea pigs. If an infected mother passes it to her fetus it can cause issues with brain development, long-term neurological and/or visual impairment, and higher mortality rates after birth.53

Maternal Factors

There are additional factors that affect the outcome of pregnancy for both mother and child. Let’s look at these next.

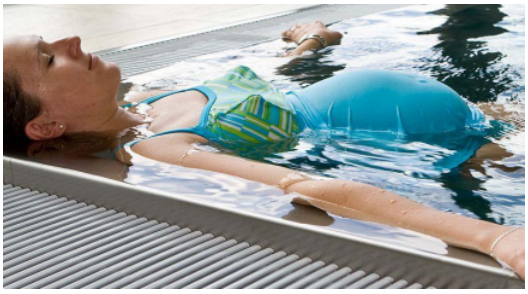

Figure 2.2.9: A pregnant woman relaxing in a tub. (Image by Thomas Pompernigg is licensed under CC BY-SA 2.0)

Mothers over 35

Most women over 35 who become pregnant are in good health and have healthy pregnancies. However, according to the March of Dimes (2016d), women over age 35 are more likely to have an increased risk of:

- Fertility problems
- High blood pressure
- Diabetes
- Miscarriages
- Placenta Previa
- Cesarean section
- Premature birth
- Stillbirth
- A baby with a genetic disorder or other birth defects

Because a woman is born with all her eggs, environmental teratogens can affect the quality of the eggs as women get older. Also, a woman's reproductive system ages which can adversely affect the pregnancy. Some women over 35 choose special prenatal screening tests, such as a maternal blood screening, to determine if there are any health risks for the baby.

Although there are medical concerns associated with having a child later in life, there are also many positive consequences to being a more mature parent. Older parents are more confident, less stressed, and typically married, providing family stability. Their children perform better on math and reading tests, and they are less prone to injuries or emotional troubles (Albert, 2013). Women who choose to wait are often well educated and lead healthy lives. According to Gregory (2007), older women are more stable, demonstrate a stronger family focus, possess greater self-confidence, and have more money. Having a child later in one's career equals overall higher wages. In fact, for every year a woman delays motherhood, she makes 9% more in lifetime earnings. Lastly, women who delay having children actually live longer.

Teenage Pregnancy

A teenage mother is at a greater risk for having pregnancy complications including anemia, and high blood pressure. These risks are even greater for those under age 15. Infants born to teenage mothers have a higher risk for being premature and having low birthweight or other serious health problems. Premature and low birthweight babies may have organs that are not fully developed which can result in breathing problems, bleeding in the brain, vision loss, serious intestinal problems, and higher likelihood of dying. Reasons for these health issues include that teenagers are the least likely of all age groups to get early and regular prenatal care and they may engage in negative behaviors including eating unhealthy food, smoking, drinking alcohol, and taking drugs.

Gestational Diabetes

Seven percent of pregnant women develop **gestational diabetes** (March of Dimes, 2015b). Diabetes is a condition where the body has too much glucose in the bloodstream.

Figure 2.16: A gestational diabetes kit. (Image by Jessica Merz is licensed under CC BY 2.0)

Most pregnant women have their glucose level tested between 24 to 28 weeks of pregnancy. Gestational diabetes usually goes away after the mother gives birth, but it might indicate a risk for developing diabetes later in life. If untreated, gestational diabetes can cause premature birth, stillbirth, the baby having breathing problems at birth, jaundice, or low blood sugar. Babies born to mothers with gestational diabetes can also be considerably heavier (more than 9 pounds) making the labor and birth process more difficult. For expectant mothers, untreated gestational diabetes can cause preeclampsia (high blood pressure and signs that the liver and kidneys may not be working properly) discussed later in the chapter.

Risk factors for gestational diabetes include age (being over age 25), being overweight or gaining too much weight during pregnancy, family history of diabetes, having had gestational diabetes with a prior pregnancy, and race and ethnicity (African-American, Native American, Hispanic, Asian, or Pacific Islander have a higher risk). Eating healthy and maintaining a healthy weight during pregnancy can reduce the chance of gestational diabetes. Women who already have diabetes and become pregnant need to attend all their prenatal care visits, and follow the same advice as those for women with gestational diabetes as the risk of preeclampsia, premature birth, birth defects, and stillbirth are the same.

High Blood Pressure (Hypertension)

Hypertension is a condition in which the pressure against the wall of the arteries becomes too high. There are two types of high blood pressure during pregnancy, gestational and chronic. Gestational hypertension only occurs during pregnancy and goes away after birth. Chronic high blood pressure refers to women who already had hypertension before the pregnancy or to those who developed it during pregnancy and it did not go away after birth.

Figure 2.17: A woman having her blood pressure taken. (Image by rawpixel on Unsplash)

According to the March of Dimes (2015c), about 8 in every 100 pregnant women have high blood pressure. High blood pressure during pregnancy can cause premature birth and low birth weight (under five and a half pounds), placental abruption, and mothers can develop preeclampsia.

Rh Disease

Rh is a protein found in the blood. Most people are Rh positive, meaning they have this protein. Some people are Rh negative, meaning this protein is absent. Mothers who are Rh negative are at risk of having a baby with a form of anemia called Rh disease (March of Dimes, 2009). A father who is Rh-positive and mother who is Rh-negative can conceive a baby who is Rh-positive. Some of the fetus's blood cells may get into the mother's bloodstream and her immune system is unable to recognize the Rh factor.

The immune system starts to produce antibodies to fight off what it thinks is a foreign invader. Once her body produces immunity, the antibodies can cross the placenta and start to destroy the red blood cells of the developing fetus. As this process takes time, often the first Rh positive baby is not harmed, but as the mother's body will continue to produce antibodies to the Rh factor across her lifetime, subsequent pregnancies can pose greater risk for an Rh positive baby. In the newborn, Rh disease can lead to jaundice, anemia, heart failure, brain damage and death.

Weight Gain during Pregnancy

According to March of Dimes (2016f), during pregnancy most women need only an additional 300 calories per day to aid in the growth of the fetus. Gaining too little or too much weight during pregnancy can be harmful. Women who gain too little may have a baby who is low-birth weight, while those who gain too much are likely to have a premature or large baby. There is also a greater risk for the mother developing preeclampsia and diabetes, which can cause further problems during the pregnancy.

The table below shows the healthy weight gain during pregnancy. Putting on the weight slowly is best. Mothers who are concerned about their weight gain should talk to their health care provider.

Table 2.10: Weight Gain during Pregnancy

If you were a healthy weight before pregnancy:	If you were underweight before pregnancy:	If you were overweight before pregnancy:	If you were obese before pregnancy:
• Gain 25-35 pounds • 1-4½ pounds in the 1st trimester • 1 pound per week in the 2nd and 3rd trimesters	• Gain 28-30 pounds • 1-4½ pounds in the 1st trimester • A little more than 1 pound per week thereafter	• Gain 12-25 pounds • 1-4½ pounds in the 1st trimester • A little more than ½ pound per week in 2nd and 3rd trimesters	• 11-20 pounds • 1-4½ pounds in the 1st trimester • A little more than ½ pound per week in 2nd and 3rd trimesters

Mothers of twins or higher order multiples need to gain more in each category.

Stress

Feeling stressed is common during pregnancy, but high levels of stress can cause complications including having a premature baby or a low-birthweight baby. Babies born early or too small are at an increased risk for health problems. Stress-related hormones may cause these complications by affecting a woman's immune systems resulting in an infection and premature birth. Additionally, some women deal with stress by smoking, drinking alcohol, or taking drugs, which can lead to problems in the pregnancy. High levels of stress in pregnancy have also been correlated with problems in the baby's brain development and immune system functioning, as well as childhood problems such as trouble paying attention and being afraid (March of Dimes, 2012b).

Depression

Depression is a significant medical condition in which feelings of sadness, worthlessness, guilt, and fatigue interfere with one's daily functioning. Depression can occur before, during, or after pregnancy, and 1 in 7 women are treated for depression sometime between the year before pregnancy and year after pregnancy (March of Dimes, 2015a). Women who have experienced depression previously are more likely to have depression during pregnancy. Consequences of depression include the baby being born premature, having a low birthweight, being more irritable, less active, less attentive, and having fewer facial expressions.

About 13% of pregnant women take an antidepressant during pregnancy. It is important that women taking antidepressants during pregnancy discuss the medication with a health care provider as some medications can cause harm to the developing organism.

Paternal Impact

The age of fathers at the time of conception is also an important factor in health risks for children. According to Nippoldt (2015), offspring of men over 40 faces an increased risk of miscarriages, autism, birth defects, achondroplasia (bone growth disorder) and schizophrenia. These increased health risks are thought to be due to accumulated chromosomal aberrations and mutations during the maturation of sperm cells in older men (Bray, Gunnell, & Smith, 2006). However, like older women, the overall risks are small.

In addition, men are more likely than women to work in occupations where hazardous chemicals, many of which have teratogenic effects or may cause genetic mutations, are used (Cordier, 2008). These may include petrochemicals, lead, and pesticides that can cause normal sperm and lead to miscarriages or diseases. Men are also more likely to be a source of second hand smoke for their developing offspring. As noted earlier, smoking by either the mother or around the mother can hinder prenatal development. 57

Figure 2.18: A USDA employee pouring hazardous chemicals into a storage container. (Image by USDA is in the public domain)

Prenatal Assessment

A number of assessments are suggested to women as part of their routine prenatal care to find conditions that may increase the risk of complications for the mother and fetus (Eisenberg, Murkoff, & Hathaway, 1996). These can include blood and urine analyses and screening and diagnostic tests for birth defects.

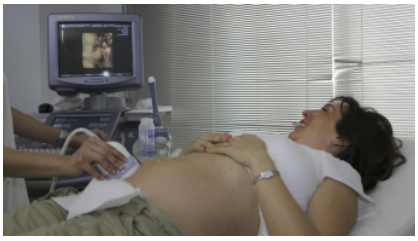

Figure 2.19: A woman receiving an ultrasound. (Image by MedicalPrudens is licensed under CC0 1.0)

Ultrasound is one of the main screening tests done in combination with blood tests. The ultrasound is a test in which sound waves are used to examine the fetus. There are two general types. Transvaginal ultrasounds are used in early pregnancy, while transabdominal ultrasounds are more common and used after 10 weeks of pregnancy (typically, 16 to 20 weeks).

Ultrasounds are used to check the fetus for defects or problems. It can also find out the age of the fetus, location of the placenta, fetal position, movement, breathing and heart rate, amount of amniotic fluid in the uterus, and number of fetuses. Most women have at least one ultrasound during pregnancy, but if problems are noted, additional ultrasounds may be recommended.

When diagnosis of a birth defect is necessary, ultrasounds help guide the more invasive diagnostic tests of amniocentesis and chorionic villus sampling. **Amniocentesis** is a procedure in which a needle is used to withdraw a small amount of amniotic fluid and cells from the sac surrounding the fetus and later tested.

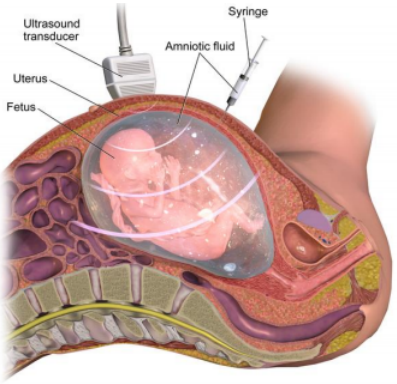

Figure 2.20: Amniocentesis. (Image by BruceBlaus is licensed under CC BY-SA 4.0)

Chorionic Villus Sampling is a procedure in which a small sample of cells is taken from the placenta and tested. Both amniocentesis and chorionic villus sampling have a risk of miscarriage, and consequently, they are not done routinely. 61

Complications of Pregnancy

There are a number of common side effects of pregnancy. Not everyone experiences all of these, nor to the same degree. And although they are considered "minor", this is not to say that these problems are not 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). These are minor issues.

But there are also serious complications of pregnancy which can pose health risks to mother and child and that often require hospitalization.

Hyperemesis gravidarum is characterized by severe nausea, vomiting, weight loss, and possibly dehydration. Signs and symptoms may also include vomiting many times a day and feeling faint. The exact causes of hyperemesis gravidarum are unknown. Risk factors include the first pregnancy, multiple pregnancy, obesity, prior or family history of HG, trophoblastic disorder, and a history of eating disorders. Treatment includes drinking fluids and a bland diet. Medication, intravenous fluids, and hospitalization may be required. Hyperemesis gravidarum is estimated to affect 0.3–2.0% of pregnant women. Those affected have a low risk of miscarriage but a higher risk of premature birth.

Ectopic Pregnancy occurs when the zygote becomes attached to the fallopian tube before reaching the uterus. About 1 in 50 pregnancies in the United States are tubal pregnancies and this number has been increasing because of the higher rates of pelvic inflammatory disease and Chlamydia (Carroll, 2007). Abdominal pain, vaginal bleeding, nausea and fainting are symptoms of ectopic pregnancy.

Figure 2.21: An ectopic pregnancy. (Image by Takatakatakumi is licensed under CC BY-SA 3.0)

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 (Carrell et. al., 2003).

Preeclampsia, also known as **Toxemia**, is characterized by a sharp rise in blood pressure, a leakage of protein into the urine as a result of kidney problems, and swelling of the hands, feet, and face during the third trimester of pregnancy. Preeclampsia is the most common complication of pregnancy. When preeclampsia causes seizures, the condition is known as eclampsia, which is the second leading cause of maternal death in the United States. Preeclampsia is also a leading cause of fetal complications, which include low birth weight, premature birth, and stillbirth. Treatment is typically bed rest and sometimes medication. If this treatment is ineffective, labor may be induced.

Maternal Mortality: Approximately 1000 women die in childbirth around the world each day (World Health Organization, 2010). Rates are highest in Sub-Saharan Africa and South Asia, although there has been a substantial decrease in these rates. The campaign to make childbirth safe for everyone has led to the development of clinics accessible to those living in more isolated areas and training more midwives to assist in childbirth.63

Infertility and Building Families

Infertility

When a couple has failed to conceive a child in a year, they receive the diagnosis of infertility. Infertility affects about 10 to 15 percent of couples in the United States (Mayo Clinic, 2015). 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 the failure to ovulate. Another cause of infertility in women is Pelvic Inflammatory Disease (PID), which is an infection of a woman's reproductive organs (Carroll, 2007).

Both male and female factors contribute to the remainder of cases of infertility. 64

Options for Building Families

There are numerous options to pursue parenthood and building families. Let's briefly explore some of these.

Assisted Reproductive Technology Assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such as fertility medication (to stimulate ovulation), surgical procedures, artificial insemination IUI), in vitro fertilization (IVF) and surrogacy. These options are available for people who are experiencing infertility or cannot conceive children naturally (which also includes single parents, and gay/lesbian couples). 65

***Intrauterine insemination*:** (IUI) as a type of artificial insemination involves the placement of sperm directly into the uterus at the time of ovulation, either in a natural menstrual cycle or following ovarian stimulation. 66

In vitro fertilization (IVF): IVF generally starts with stimulating the ovaries to increase egg production. Most fertility medications are agents that stimulate the development of follicles in the ovary. Examples are gonadotropins and gonadotropin releasing hormone. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman's reproductive tract, in a procedure called embryo transfer. 67

Figure 2.22: The IVF process. (Image by Manu5 is licensed under CC BY-SA 4.0)

Donor Gametes & Embryos: People can also use sperm, ova (eggs), and embryos from donors in conjunction with ART. These donations take place through agencies and donor banks or between private individuals. In the U.S., donors can be compensated for their donations.

Surrogacy: In surrogacy, one woman (surrogate mother) carries a child for another person/s (commissioning person/couple), based on a legal agreement before conception requiring the child to be relinquished to the commissioning person/couple following birth. There are different types of surrogacy which relate to whether or not the ova used to conceive the child are her own (**traditional surrogacy**) or not (**gestational surrogacy**). 69

Adoption: People can also choose to pursue **adoption** to build their families (with or without experiencing infertility). Adoption can take place through the foster care system, privately, or through agencies. Adoptions can be domestic (within the U.S.) or international. And they can be open (with differing amounts of contact between biological/birth families and adoptive families) or closed.

Family Built with Surrogacy

Figure 2.23: This same-sex couple used a surrogate. (Photo by Daryn Crawford used with permission)

Family Built through Adoption

Figure 2.24: This single mother adopted her daughter. (Photo by Michaela Szidloski used with permission)

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2.S: Summary

In this chapter we looked at:

- Heredity, including genetic disorders and chromosomal abnormalities
- Conception
- The germinal, embryonic, and fetal stages of prenatal development
- Influences on prenatal development including teratogens and maternal and paternal factors
- Complications of pregnancy
- Infertility and options for building families

Now let's explore birth and the newborn baby.

3: BIRTH AND THE NEWBORN

Paris, Ricardo, Raymond, & Johnson
College of the Canyons

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CHAPTER OVERVIEW

3: Birth and the Newborn

Learning Objectives

After this chapter, you should be able to:

- Compare and contrast different methods of childbirth preparation.
- Describe the stages of vaginal delivery.
- Explain why induction or Caesarean section may be necessary.
- Differentiate the common procedures for assessing the condition of the newborn.
- Examine problems newborns experience before, during, and after birth.

After around 266 days of developing inside the womb (for a full-term pregnancy), comes the arduous process of childbirth. After birth, newborns have to regulate their own body temperature, breathe for themselves, and take in all of their nutrition through feeding. Let's look at both the process of birth and some attributes of the newborn.

Thumbnail: pixabay.com/photos/baby-slee...y-girl-784608/

3.1: Preparing for Childbirth

Prepared childbirth refers to being not only in good physical condition to help provide a healthy environment for the baby to develop, but also helping individuals to prepare to accept their new roles as parents. Additionally, parents can receive information and training that will assist them for delivery and life with the baby. The more future parents can learn about childbirth and the newborn, the better prepared they will be for the adjustment they must make to a new life.

Approaches to Childbirth

There are many different approaches to childbirth that influence how expectant parents prepare. The following table describes a few of these:

Table 3.1.1: Approaches to Childbirth (Lifespan Development: A Psychological Perspective (page 59) by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0; Lifespan Development - Module 3: Prenatal Development by Lumen Learning references Psyc 200 Lifespan Psychology by Laura Overstreet, licensed under CC BY 4.0)

Method	Description
The Lamaze Method	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 Leboyer Method	This method involves giving birth in a quiet, dimly lit room and allowing the newborn to lie on the mother's stomach with the umbilical cord intact for several minutes while being given a warm bath.
Dick-Read Method / Mongan Method / Hypnobirthing	This method comes from the suggestion that the fear of childbirth increases tension and makes the process of childbearing more painful. It emphasizes the use of relaxation and proper breathing with contractions as well as family support and education.
Bradley Method	"The Bradley Method focuses on preparing the mother for a natural childbirth coached by her partner. They learn techniques to reduce the perception of pain and stay relaxed. The emphasis is on being prepared for an unassisted vaginal birth without medication." 2
Alexander Technique	This is a technique that can be used during childbirth that involves training to stop habitual reactions to pain, such as tensing muscles and increase conscious awareness and control over posture and movement. This involves being able to move freely and stay upright during labor and using body positioning that is beneficial to the labor process.3
Waterbirth	Involves immersion in warm water. Proponents believe this method is safe and provides many benefits for both mother and infant, including pain relief and a less traumatic birth experience for the baby. However, critics argue that the procedure introduces unnecessary risks to the infant such as infection and water inhalation.4
Lotus Birth	Or umbilical cord nonseverance – UCNS, is the practice of leaving the umbilical cord uncut after childbirth so that the baby is left attached to the placenta until the cord naturally separates at the umbilicus. This usually occurs within 3–10 days after birth. The practice is performed mainly for spiritual purposes of the parents, including for the perceived spiritual connection between placenta and newborn.5
Silent Birth	Sometimes known as quiet birth, is a birthing procedure advised by L. Ron Hubbard and advocated by Scientologists in which "everyone attending the birth should refrain from spoken words as much as possible." 6

Method	Description
Medicated Childbirth	Health care providers can provide pain relief during labor with different types of medication, including epidurals, spinal blocks, combined spinal-epidurals, and systemic and local analgesia. There are benefits and side effects of each.7

Figure 3.1.1: Expectant parents in a childbirth preparation class. (Image by liz.schrenk is licensed under CC BY-NC-ND 2.0)

Choosing Location of Childbirth & Who Will Deliver

The vast majority of births occur in a hospital setting. However, one percent of women choose to deliver at home (Martin, Hamilton, Osterman, Curtin, & Mathews, 2015). Women who are at low risk for birth complications can successfully deliver at home. More than half (67%) of home deliveries are by certified nurse midwives. Midwives are trained and licensed to assist in delivery and are far less expensive than the cost of a hospital delivery. However, because of the potential for a complication during the birth process, most medical professionals recommend that delivery take place in a hospital. In addition to home births, one-third of out-of-hospital births occur in freestanding clinics, birthing centers, in physician's offices, or other locations.

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3.2: Childbirth

Onset of Labor

Childbirth typically occurs within a week of a woman's due date, unless the woman is pregnant with more than one fetus, which usually causes her to go into labor early. As a pregnancy progresses into its final weeks, several physiological changes occur in response to hormones that trigger labor.

A common sign that labor is beginning is the so-called "bloody show." During pregnancy, a plug of mucus accumulates in the cervical canal, blocking the entrance to the uterus. Approximately 1–2 days prior to the onset of true labor, this plug loosens and is expelled, along with a small amount of blood.

As labor nears, the mothers' pituitary gland produces oxytocin. This begins to stimulate stronger, more painful uterine contractions, which—in a positive feedback loop—stimulate the secretion of prostaglandins from fetal membranes. Like oxytocin, prostaglandins also enhance uterine contractile strength. The fetal pituitary gland also secretes oxytocin, which increases prostaglandins even further.

And the stretching of the cervix by a full-term fetus in the head-down position is regarded as a stimulant to uterine contractions. Combined, these stimulate true labor. 10

Stages of Birth for Vaginal Delivery

The First Stage

Uterine contractions signify that the first stage of labor has begun. These contractions 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 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. In one out of 8 pregnancies, the amniotic sac or water in which the fetus is suspended may break before labor begins. In such cases, the physician may induce labor with the use of medication if it does not begin on its own in order to reduce the risk of infection. Normally this sac does not rupture until the later stages of labor.

The first stage of labor is typically the longest. 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. Labor may also begin with a discharge of blood or amniotic fluid.

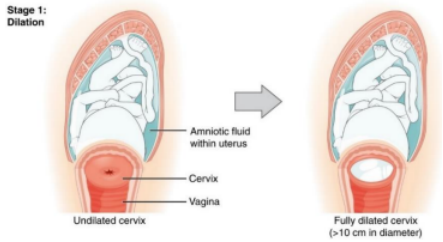

Figure 3.2.1: Early cervical dilation. (Image by OpenStax is licensed under CC BY 3.0)

The Second Stage

The passage of the baby through the birth canal is the second stage of labor. 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. At this stage, an episiotomy, or incision made in the tissue between the vaginal opening and anus, may be performed to avoid tearing the tissue of the back of the vaginal opening (Mayo Clinic, 2016). The baby's mouth and nose are suctioned out. The umbilical cord is clamped and cut. 12

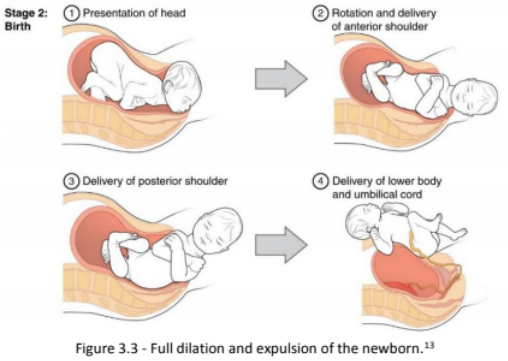

Figure 3.3 - Full dilation and expulsion of the newborn.[13]

Figure 3.2.2: Full dilation and expulsion of the newborn. (Image by OpenStax is licensed under CC BY 3.0)

The Third Stage

The third and final stage of labor is relatively painless. During this stage, the placenta or afterbirth is delivered. This is typically within 20 minutes after delivery. If an episiotomy was performed it is stitched up during this stage. 14

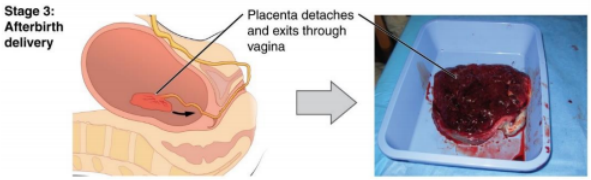

Figure 3.2.3: delivery of the placenta and associated fetal membranes. (Image by OpenStax is licensed under CC BY 3.0)

Additional Considerations

More than 50% of women giving birth at hospitals use an epidural anesthesia during delivery (American Pregnancy Association, 2015). An epidural block is a regional analgesic that can be used during labor and alleviates most pain in the lower body without slowing labor. The epidural block can be used throughout labor and has little to no effect on the baby. Medication is injected into a small space outside the spinal cord in the lower back. It takes 10 to 20 minutes for the medication to take effect. An epidural block with stronger medications, such as anesthetics, can be used shortly before a Cesarean Section or if a vaginal birth requires the use of forceps or vacuum extraction. 16

Women giving birth can also receive other pain medications (although medications given through injection can have negative side effects on the baby). In emergency situations (such as the need for a C-section), women may be given general anesthesia. They can also choose not to utilize any pain medications. That is often referred to as **natural childbirth**.

Figure 3.2.4: Natural childbirth. (Image by U.S. Army Alaska is licensed under CC BY 2.0)

Women can also use alternate positions (including standing, squatting, being on hands and knees, and using a birthing stool) and laboring, and even delivering in tubs of warm water to help relieve the pain of childbirth.

Medical Interventions in Childbirth

Sometimes women cannot go into labor on their own and/or deliver vaginally. Let's look at induction of labor and Cesarean Sections.

Sometimes a baby's arrival may need to be induced before labor begins naturally. **Induction of labor** may be recommended for a variety of reasons when there is concern for the health of the mother or baby. For example:

- The mother is approaching two weeks beyond her due date and labor has not started naturally
- The mother's water has broken, but contractions have not begun
- There is an infection in the mother's uterus
- The baby has stopped growing at the expected pace
- There is not enough amniotic fluid surrounding the baby
- The placenta peels away, either partially or completely, from the inner wall of the uterus before delivery
- The mother has a medical condition that might put her or her baby at risk, such as high blood pressure or diabetes (Mayo Clinic, 2014).

A Cesarean Section (C-section) is surgery to deliver the baby by being removed through the mother's abdomen. In the United States, about one in three women have their babies delivered this way (Martin et al., 2015). Most C-sections are done when problems occur during delivery unexpectedly. These can include:

- Health problems in the mother
- Signs of distress in the baby
- Not enough room for the baby to go through the vagina
- The position of the baby, such as a breech presentation where the head is not in the downward position.

Figure 3.2.5: A woman receiving a C-section. (Image by Tammra M is licensed under CC BY 2.0)

Figure 3.2.6: A baby being delivered by C-section. (Image by Patricia Prudente on Unsplash)

C-sections are also more common among women carrying more than one baby. Although the surgery is relatively safe for mother and baby, it is considered major surgery and carries health risks. Additionally, it also takes longer to recover from a C-section than from vaginal birth. After healing, the incision may leave a weak spot in the wall of the uterus. This could cause problems with an attempted vaginal birth later. In the past, doctors were hesitant to allow a vaginal birth after a C-section. However, now more than half of women who have a C-section go on to have a vaginal birth later. 20 This is referred to as a **Vaginal Birth After Cesarean (VBAC)**.

Contributors and Attributions

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3.3: The Newborn

Figure 3.3.1: A new mother holding her newborn. (Image by the U.S. Air Force is in the public domain)

Assessing the Newborn

The **Apgar assessment** 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: Heart rate, respiration, muscle tone (assessed 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. 22

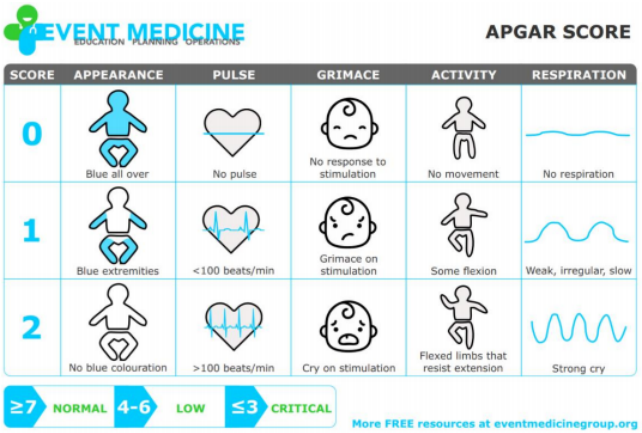

Figure 3.3.2: The Apgar assessment. (Image by Event Medicine Group)

Another way to assess the condition of the newborn is the Neonatal Behavioral Assessment Scale (NBAS). The baby's motor development, muscle tone, and stress response are assessed. This tool has been used around the world to further assess the newborn, especially those with low Apgar scores, and to make comparisons of infants in different cultures (Brazelton & Nugent, 1995).

Newborns are also routinely screened for different conditions. Within the first 24 to 48 hours after birth, babies born in hospitals undergo a simple heel stick and a few drops of blood are collected on a special paper card. Providers test those dried blood spots for a variety of different congenital disorders, or conditions that are present when the baby is born. In California, newborns are now screened for 80 different genetic and congenital disorders.

Figure 3.3.3: A medical professional performing the heel stick test. (Image by the U.S. Air Force is in the public domain)

Newborns are also screened for hearing disorders and certain serious heart problems using methods other than dried blood spots. 25

Problems of the Newborn

Anoxia

Anoxia is a temporary lack of oxygen to the brain. Difficulty during delivery may lead to anoxia which can result in brain damage or in severe cases, death. Babies who suffer both low birth weight and anoxia are more likely to suffer learning disabilities later in life as well.

Low Birth Weight

A child is considered low birth weight if he or she weighs less than 5 pounds 8 ounces (2500 grams). About 8.2 percent of babies born in the United States are of low birth weight (Center for Disease Control, 2015a). Sixty-seven percent of these babies are also preterm.

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 for 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.

Preterm

A newborn might also have a **low birth weight** if it is born at less than 37 weeks gestation, which qualifies it as a **preterm baby** (CDC, 2015c). Early birth can be triggered by anything that disrupts the mother's system. For instance, vaginal infections can 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 lead to preterm birth. A significant consequence of preterm birth includes respiratory distress syndrome, which is characterized by weak and irregular breathing (see the image below). Premature babies often cannot yet regulate their own temperature or feed by nursing or bottle. They may struggle to regulate their heart rate effectively and may experience jaundice. They often require care in the Neonatal Intensive Care Unit (NICU) until they are as healthy as a full-term baby.

Figure 3.3.4: a premature baby on CPAP in the NICU. (Photo by Jennifer Paris used with permission)

Small-for-Date Infants

Infants that have birth weights that are below expectation based on their gestational age are referred to as **small-for-date**. These infants may be full term or preterm (see image below), but still weigh less than 90% of all babies of the same gestational age. This is a very serious situation for newborns as their growth was adversely affected. Regev et al. (2003) found that small-for-date infants died at rates more than four times higher than other infants.

Figure 3.3.5: This baby was born at 32 weeks and only weighed 2 pounds and 15 ounces. (Photo by Jennifer Paris used with permission)

Postmature

When babies are not born by 42 weeks gestation, or two weeks after their due date, they are considered overdue or **postmature**. There are some concerns about how long the placenta can function and most doctors will consider induction for overdue babies.

Stillborn

When a fetus (unborn baby) dies while still inside the mother (after 20-24 weeks gestation) or dies during delivery (childbirth). It is said that the delivered baby is stillborn. The causes of many stillbirths are unknown, even when special tests are done to learn the cause. Possible causes include: nicotine, alcohol, or drugs taken by the mother during pregnancy, physical trauma, radiation poisoning, Rh disease, and umbilical cord problems. The number of stillbirths in the United States is about 1 in 115 births, which is about 26,000 a year, or one every 20 minutes. 28

Characteristics of Newborns

Size

The average newborn in the United States weighs about 7.5 pounds and is about 20 inches in length. 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.

Figure 3.3.6: A newborn being weighed. (Image by Trei Brundrett is licensed under CC BY-SA 2.0)

Body Proportions

The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!).

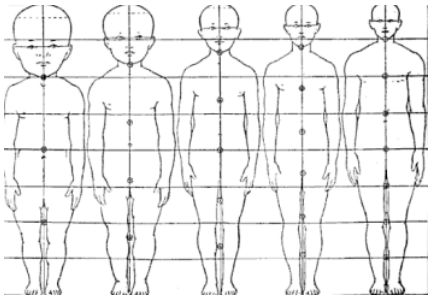

Figure 3.3.7: Body proportions from infancy to adulthood. (Image is in the public domain)

Brain Development

Some of the most dramatic physical change that occurs during this period is in the brain. At birth, the brain is about 25 percent its adult weight and this is not true for any other part of the body. While most of the brain's 100 to 200 billion neurons are present at birth, they are not fully mature. During the next several years dendrites or connections between neurons will undergo a period of transient exuberance or temporary dramatic growth. 31

Appearance at Birth

During labor and birth, the infant's skull changes shape to fit through the birth canal, sometimes causing the child to be born with a misshapen or elongated head. It will usually return to normal on its own within a few days or weeks.

Some newborns have a fine, downy body hair called lanugo. It may be particularly noticeable on the back, shoulders, forehead, ears and face of premature infants. Lanugo disappears within a few weeks. Likewise, not all infants are born with lush heads of hair. Some may be nearly bald while others may have very fine, almost invisible hair. Some babies are even born with a full head of hair.

Amongst fair-skinned parents, this fine hair may be blond, even if the parents are not. The picture on the left shows lanugo on the shoulders of newborn twins.

Figure 3.3.8: Lanugo on the shoulder and back of twin girls. (Image is in the public domain)

Figure 3.3.9: A newborn baby covered in vernix. (Image by Upsilon Andromedae is licensed under CC BY 2.0)

Immediately after birth, a newborn's skin is often grayish to dusky blue in color. As soon as the newborn begins to breathe, usually within a minute or two, the skin's color returns to its normal tone. Newborns are wet, covered in streaks of blood, and coated with a white substance known as **vernix**, which is thought to act as an antibacterial barrier, seen in the picture on the right.

The scalp may also be temporarily bruised or swollen, especially in hairless newborns, and the area around the eyes may be puffy.

The newborn may also have Mongolian spots (blue or blue black birthmark on the lower back), various other birthmarks, or peeling skin, particularly on the wrists, hands, ankles, and feet. 34

A newborn's genitals are enlarged and reddened, with male infants having an unusually large scrotum. The breasts may also be enlarged, even in male infants. This is caused by naturally-occurring maternal hormones and is a temporary condition.

The umbilical cord of a newborn is bluish-white in color. After birth, the umbilical cord is normally cut, leaving a 1–2 inch stub. The umbilical stub will dry out, shrivel, darken, and spontaneously fall off within about 3 weeks. Occasionally, hospitals may apply triple dye to the umbilical stub to prevent infection, which may temporarily color the stub and surrounding skin purple.

Figure 3.3.10: The clamping and cutting of a newborn’s umbilical cord. (Image by NNethala is licensed under CC BY-SA 3.0)

Newborns lose many of the above physical characteristics quickly. Thus older babies look very different. While older babies are considered "cute," newborns can be "unattractive" by the same criteria and first time parents may need to be educated in this regard. 36

Sleep

A newborn typically sleeps approximately 16.5 hours per 24-hour period. The infant sleeps in several periods throughout the day and night, which means they wake often throughout the day and night. (Salkind, 2005). 37

Figure 3.3.11: An older newborn baby. (Image by brytny.com on Unsplash)

Reflexes

Newborns are equipped with a number of **reflexes**, which are involuntary movements in response to stimulation. Some of the more common reflexes, such as the sucking reflex and rooting reflex, are important to feeding. The grasping and stepping reflexes are eventually replaced by more voluntary behaviors. Within the first few months of life these reflexes disappear, while other reflexes, such as the eye-blink, swallowing, sneezing, gagging, and withdrawal reflex stay with us as they continue to serve important functions. 39

Sensory Capacities

Throughout much of history, the newborn was considered a passive, disorganized being who possessed minimal abilities. However, current research techniques have demonstrated just how developed the newborn is with especially organized sensory and perceptual abilities.

Vision

The womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth and time is needed to build those neural pathways between the eye and the brain. Newborns typically cannot see further than 8 to 16 inches away from their faces, and their visual acuity is about 20/400, which means that an infant can see something at 20 feet that an adult with normal vision could see at 400 feet. Thus, the world probably looks blurry to young infants.

Figure 3.3.12: A newborn gazing up at a parent. (Image is in the public domain)

Hearing

The infant's sense of hearing is very keen at birth, and the ability to hear is evidenced as soon as the 7th 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 unfamiliar voice even earlier. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech, which will be discussed later. Newborns also prefer their mother's voices over another female when speaking the same material (DeCasper & Fifer, 1980). Additionally, they will register in utero specific information heard from their mother's voice. 41

Early Hearing

DeCasper and Spence (1986) tested 16 infants whose mothers had previously read to them prenatally. The mothers read several passages to their fetuses, including the first 28 paragraphs of The Cat in the Hat, beginning when they were 7 months pregnant. The fetuses had been exposed to the stories on average of 67 times or 3.5 hours.

During the testing, the infants were able to choose between recordings of two stories, one of which was a story their mothers read to them while in the womb, based on how fast they sucked on their pacifiers. They showed a preference for the stories that their mothers read to them while in the womb. 42

Figure 3.3.13: A collection of children's books. (Image by kamiel79 on pixabay)

Touch and Pain

Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013). Newborns who are circumcised, which is 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). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, many circumcisions are now done with the use of local anesthetics.

Taste and Smell

Studies of taste and smell demonstrate that babies respond with different facial expressions, suggesting that certain preferences are innate. Newborns can distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. Newborns also prefer the smell of their mothers. An infant only 6 days old is significantly more likely to turn toward its own mother's breast pad than to the breast pad of another baby's mother (Porter, Makin, Davis, & Christensen, 1992), and within hours of birth an infant also shows a preference for the face of its own mother (Bushnell, 2001; Bushnell, Sai, & Mullin, 1989).

Infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with a smooth surface preferred looking at visual models of a pacifier with a smooth surface. But those that were given a pacifier with a textured surface preferred to look at a visual model of a pacifier with a textured surface. 44

Figure 3.3.14: A baby sucking on a pacifier. (Image by Beeki is licensed under CC0 1.0)

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34. Mongolian Spot by Wiktionary is licensed under CC BY-SA 3.0

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3.S: Summary

In this chapter we looked at:

- methods of childbirth preparation
- the process of childbirth (for both vaginal and Cesarean deliveries)
- assessing newborn health
- problems for the newborn
- characteristics of newborns (including appearance, reflexes, and perceptual abilities)

In the next three chapters we will explore the first three years of life more. Many rapid changes occur during these foundational years.

4: PHYSICAL DEVELOPMENT IN INFANCY AND TODDLERHOOD

Paris, Ricardo, Raymond, & Johnson
College of the Canyons

CHAPTER OVERVIEW

4: Physical Development in Infancy and Toddlerhood

Learning Objectives

After this chapter, you should be able to:

1. Describe the physical changes that occur during the first two years of life.
2. Identify common infant reflexes.
3. Discuss the sleep needs during the first two years of life.
4. Summarize the sequence of both fine and gross motor skills.
5. Recognize the developing sensory capacities of infants and toddlers.
6. Explain how to meet the evolving nutritional needs of infants and toddlers.

Welcome to the story of development from infancy through toddlerhood; from birth until about two years of age. 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 and perhaps because we have assumed that 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 the period of life that contemporary educators, healthcare providers, and parents have focused on most heavily. We will examine growth and nutrition during infancy, as well as other prominent physical changes that take place during this time.[1]

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Thumbnail: www.pexels.com/photo/child-i...n-road-786220/

4.1: Rapid Physical Changes

As mentioned in the previous chapter, the average newborn in the United States weighs about 7.5 pounds and is about 20 inches in length. After about a 5% weight loss in the first few days, there is a period of rapid 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 one year is about 26-32 inches.[3]

Figure 4.1.1: An infant sleeping. (Image by Andres and Antoinette Ricardo used with permission)

Two hormones are very important to this growth process. The first is Human Growth Hormone (HGH) which influences all growth except that in the Central Nervous System (CNS). The hormone influencing growth in the CNS is called **Thyroid Stimulating Hormone**. Together these hormones influence the growth in early childhood.

Sleep is very important to the growth process as these hormones are released as children sleep each night. As a result, children need 11 to 14 hours of sleep from 2 to 6 years old. Parents may establish rituals, such as reading a story, taking a bath, brushing teeth, etc. to help children wind down and get the sleep they so desperately need.[4]

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4.2: Proportions of the Body

Another dramatic physical change that takes place in the first several years of life is the change in body proportions. The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!). By age 25 it comprises about 20 percent our length. Imagine now 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 the stomach trying to raise the head, you know how much of a challenge this is. The comparison in this graphic was originally introduced in the last chapter.

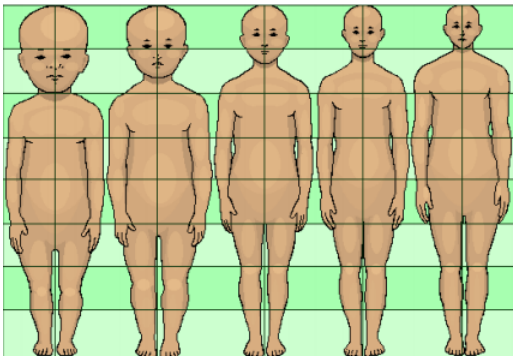

Figure 4.2.1: Shown from left to right: Human body proportions at birth, at 2 years, at 6 years, at 12 years, and at 19 years. (Image by Ephert is licensed under CC BY-SA 4.0)

Some of the most dramatic physical change that occurs during this period is in the brain. At birth, the brain is about 25 percent its adult weight and this is not true for any other part of the body. By age 2, it is at 75 percent its adult weight, at 95 percent by age 6 and at 100 percent by age 7 years.

While most of the brain's 100 to 200 billion neurons are present at birth, they are not fully mature and during the next several years **dendrites** or connections between neurons will undergo a period of transient exuberance or temporary dramatic growth.

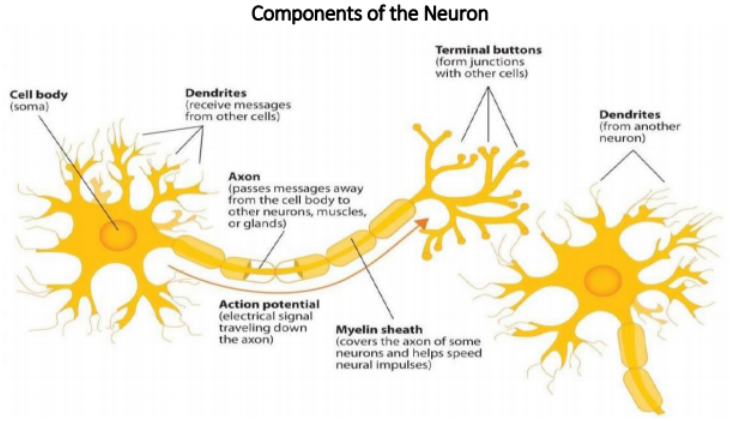

Figure 4.2.2: Components of the neuron. (Image by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0)

There is a proliferation of these dendrites during the first two years so 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 thereby making those that are used much stronger.[8] Because of this proliferation of dendrites, by age two a single neuron might have thousands of dendrites.

Synaptogenesis, or *the* formation of connections between neurons, continues from the prenatal period forming thousands of new connections during infancy and toddlerhood. This period of rapid neural growth is referred *to as* **Synaptic Blooming**.[9] This activity is occurring primarily in the cortex or the thin outer covering of the brain involved in voluntary activity and thinking.

Figure 4.2.3: MRI scans of the human brain. (Image is in the public domain)

The prefrontal cortex that is located behind our forehead continues to grow and mature throughout childhood and experiences an additional growth spurt during adolescence. It is the last part of the brain to mature and will eventually comprise 85 percent of the

brain's weight. 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). As the prefrontal cortex matures, the child is increasingly able to regulate or control emotions, to plan activity, strategize, and have better judgment. Of course, this is not fully accomplished in infancy and toddlerhood but continues throughout childhood and adolescence.

Another major change occurring in the central nervous system is the development of myelin, a coating of fatty tissues around the axon of the neuron. Myelin helps insulate the nerve cell and speed the rate of transmission of impulses from one cell to another. This enhances the building of neural pathways and improves coordination and control of movement and thought processes. The development of myelin continues into adolescence but is most dramatic during the first several years of life.[10]

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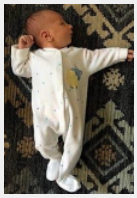
4.3: Reflexes

Infants are equipped with a number of reflexes which are involuntary movements in response to stimulation. These include the sucking reflex (infants suck on objects that touch their lips automatically), the rooting reflex (which involves turning toward any object that touches the cheek), the palmar grasp (the infant will tightly grasp any object placed in its palm), and the dancing reflex (evident when the infant is held in a standing position and moves its feet up and down alternately as if dancing). 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. 12

Infants and children grow and develop at a rapid pace during the first few years of life. The development of both gross and fine motor skills helps a child go from a completely dependent newborn to an independently functioning toddler in about a 3-year span. 13

Table 4.3.1: Some Common Infant Reflexes (Lifespan Development: A Psychological Perspective (page 74) by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0 (modified by Antoinette Ricardo))

Reflex	Description	Image	Reflex	Description	Image
Sucking	Suck on anything that touches the lips	 Figure 4.3.1 (Image is in the public domain)	**Moro**	A sudden noise or loss of support to the head and neck will cause infants to spread out their arms and legs then quickly contract the limbs inward	 Figure 4.3.2 (Image is in the public domain)
Rooting	Turning the head when the cheek is touched	 Figure 4.3.3 (Image is in the public domain)	**Tonic Neck**	When lying on the back with the head to one side infants will extend the arm and leg on that side while flexing the limbs on the opposite side (looks like a fencer pose).	 Figure 4.3.4 (Image by Samuel Finlayson is licensed under CC BY-SA 4.0)
Grasp	Fingers automatically grip anything that touches the palm of the hand	 Figure 4.3.5 (Image by Raul Luna is licensed under CC BY 2.0)	**Stepping**	Legs move in stepping like motion when feet touch a smooth surface	 Figure 4.3.6 (Image is in the public domain)
Babinski	The toes will fan out and curl when the sole of the foot is stroked from heel to toe	 Figure 4.3.7 (Image by Medicus of Borg is licensed under CC BY-SA 3.0)			

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4.4: Gross Motor Skills

Voluntary movements involve the use of large muscle groups and are typically large movements of the arms, legs, head, and torso. They are referred to as **gross motor skills** (or large motor skills). 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, and then crawling. 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! This also tends to lead infants to pull up on furniture, usually with the goal of reaching a desired object. Usually, this will also lead to taking steps and eventually walking. 22

Physical Gross Motor Milestones

As stated above, children grow very quickly and meet physical milestones rapidly in the first few years of life. The following is a table of the major **milestones** (behaviors or physical skills seen in infants and children as they grow and develop that typically occur within normal range) that occur in children during those first formative years. 23

Table 4.4.1: Gross Motor Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do by This Age
2 months	• Can hold head up and begins to push up when lying on tummy • Makes smoother movements with arms and legs
4 months	• Holds head steady, unsupported • Pushes down on legs when feet are on a hard surface • May be able to roll over from tummy to back • Brings hands to mouth • When lying on stomach, pushes up to elbows
6 months	• Rolls over in both directions (front to back, back to front) • Begins to sit without support • When standing, supports weight on legs and might bounce • Rocks back and forth, sometimes crawling backward before moving forward
9 months	• Stands, holding on • Can get into sitting position • Sits without support • Pulls to stand • Crawls
1 year	• Gets to a sitting position without help • Pulls up to stand, walks holding on to furniture ("cruising") • May take a few steps without holding on • May stand alone
18 months	• Walks alone • May walk up steps and run • Pulls toys while walking • Can help undress self
2 years	• Stands on tiptoe • Kicks a ball • Begins to run • Climbs onto and down from furniture without help • Walks up and down stairs holding on • Throws ball overhand

Figure 4.4.1: An infant playing in the sand. (Image by Andres and Antoinette Ricardo used with permission)

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23. Developmental milestones record by the U.S. National Library of Medicine is in the public domain

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4.5: Fine Motor Skills

More exact movements of the feet, toes, hands, and fingers are referred to as **fine motor skills** (or small motor skills). These include the ability to reach and grasp an object in coordination with vision. 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.

Figure 4.5.1: An infant feeding themselves. (Image by Matt Preston is licensed under CC BY-SA 2.0)

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. This is known as the **pincer grip**. 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. And as those objects will often next go into the mouth, caregivers must be vigilant about keeping items small enough to be choking hazards out of reach of little fingers. By 9 months, an infant can also watch a moving object, reach for it as it approaches and grabs it. This is quite a complicated set of actions if we remember how difficult this would have been just a few months earlier. 26

Physical Fine Motor Milestones

While fine motor skills are slower to develop (in accordance with proximodistal development), pretty remarkable progress is made in fine motor development during the first two years. As stated above, in the first few years of life children go from having no intentional fine motor control to being able to manipulate objects to play and learn, as well as beginning to care of themselves. The following is a table of the major milestones in fine motor development.

Table 4.5.1: Fine Motor Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do by This Age
2 months	• Grasps reflexively • Does not reach for objects • Holds hands in fist
4 months	• Brings hands to mouth • Uses hands and eyes together, such as seeing a toy and reaching for it • Follows moving things with eyes from side to side • Can hold a toy with whole hand (palmar grasp) and shake it and swing at dangling toys
6 months	• Reaches with both arms • Brings things to mouth • Begins to pass things from one hand to the other
9 months	• Puts things in mouth • Moves things smoothly from one hand to the other • Picks up things between thumb and index finger (pincer grip)

Typical Age	What Most Children Do by This Age
1 year	• Reaches with one hand • Bangs two things together • Puts things in a container, takes things out of a container • Lets things go without help • Pokes with index (pointer) finger
18 months	• Scribbles on own • Can help undress herself • Drinks from a cup • Eats with a spoon with some accuracy • Stacks 2-4 objects
2 years	• Builds towers of 4 or more blocks • Might use one hand more than the other • Makes copies of straight lines and circles • Enjoys pouring and filling • Unbuttons large buttons • Unzips large zippers • Drinks and feeds self with more accuracy

Contributors and Attributions

4.6: Sensory Capacities

Throughout much of history, the newborn was considered a passive, disorganized being who possessed minimal abilities. William James, an early psychologist, had described the newborn's world as "a blooming, buzzing confusion," (Shaffer, 1985). However, current research techniques have demonstrated just how developed the newborn is with especially organized sensory and perceptual abilities.

Vision

The womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth and time is needed to build those neural pathways between the eye and the brain. Newborns typically cannot see further than 8 to 16 inches away from their faces (which is about the distance from the newborn's face to the mother/caregiver when an infant is breastfeeding/bottle-feeding). Their visual acuity is about 20/400, which means that an infant can see something at 20 feet that an adult with normal vision could see at 400 feet. Thus, the world probably looks blurry to young infants. Because of their poor visual acuity, they look longer at checkerboards with fewer large squares than with many small squares. Infants' thresholds for seeing a visual pattern are higher than adults'. Thus, toys for infants are sometimes manufactured with black and white patterns rather than pastel colors because the higher contrast between black and white makes the pattern more visible to the immature visual system. By about 6 months, infants' visual acuity improves and approximates adult 20/25 acuity.

Figure 4.6.1: An infant looking up at the person feeding them. (Image by Ben_Kerckx on Pixabay)

When viewing a person's face, newborns do not look at the eyes the way adults do; rather, they tend to look at the chin - a less detailed part of the face. However, by 2 or 3 months, they will seek more detail when exploring an object visually and begin showing preferences for unusual images over familiar ones, for patterns over solids, for faces over patterns, and for three-dimensional objects over flat images. Newborns have difficulty distinguishing between colors, but within a few months, they are able to discriminate between colors as well as adults do. Sensitivity to binocular depth cues, which require inputs from both eyes, is evident by about 3 months and continues to develop during the first 6 months. 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).

Hearing

The infant's sense of hearing is very keen at birth, and the ability to hear is evident as soon as the 7th 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 unfamiliar voice even earlier. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech, which will be discussed later. Additionally, infants are innately ready to respond to the sounds of any language, but some of this ability will be lost by 7 or 8 months as the infant becomes familiar with the sounds of a particular language and less sensitive to sounds that are part of an unfamiliar language.

Newborns also prefer their mother's voices over another female when speaking the same material (DeCasper & Fifer, 1980). Additionally, they will register in utero specific information heard from their mother's voice. You may remember the Cat in the Hat study featured in the last chapter that illustrates this.

Touch and Pain

Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013). Newborns who are **circumcised**, which is 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). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, local painkillers are now used during many circumcision.

Taste and Smell

Studies of taste and smell demonstrate that babies respond with different facial expressions, suggesting that certain preferences are innate. Newborns can distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. Newborns also prefer the smell of their mothers. An infant only 6 days old is significantly more likely to turn toward its own mother's breast pad than to the breast pad of another baby's mother (Porter, Makin, Davis, & Christensen, 1992), and within hours of birth, an infant also shows a preference for the face of its own mother (Bushnell, 2001; Bushnell, Sai, & Mullin, 1989).

Figure 4.6.2: The responses of infants to different tastes. (Image by Alice Vilela and CC BY 4.0)

Infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with either a smooth or textured surface preferred to look at a corresponding (smooth or textured) visual model of the pacifier. By 4 months, infants can match lip movements with speech sounds and can match other audiovisual events. Although sensory development emphasizes the afferent processes used to take in information from the environment, these sensory processes can be affected by the infant's developing motor abilities. Reaching, crawling, and other actions allow the infant to see, touch, and organize his or her experiences in new ways. 30

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4.7: Nutrition

Nutritional needs change with age. Let’s examine how caregivers should nourish children during the first years of life and some risks to nutrition that they should be aware of.

Breastfeeding

Breast milk is considered the ideal diet for newborns. **Colostrum**, the first breast milk produced during pregnancy and just after birth has been described as “liquid gold” (United States Department of Health and Human Services (USDHHS), 2011). It is very rich in nutrients and antibodies. 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. 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. The USDHHS recommends 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 or two.

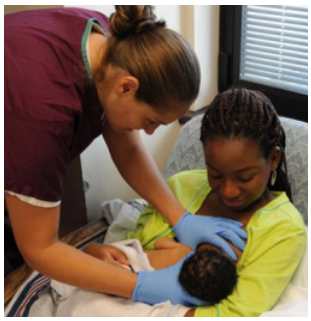

Figure 4.7.1: A nurse helping a new mother to breastfeed. (Image by the Military Health System is in the public domain)

Maternal Benefits of Breastfeeding

Several recent studies have reported that it is not just babies that benefit from breastfeeding. Breastfeeding stimulates contractions in the mother’s uterus to help it regain its normal size, and women who breastfeed are more likely to space their pregnancies further apart. Mothers who breastfeed are at lower risk of developing breast cancer (Islami et al., 2015), especially among higher risk racial and ethnic groups (Islami et al., 2015; Redondo et al., 2012). Women who breastfeed have lower rates of ovarian cancer (Titus-Ernstoff, Rees, Terry, & Cramer, 2010), reduced risk for developing Type 2 diabetes (Schwarz et al., 2010; Gunderson, et al., 2015), and rheumatoid arthritis (Karlson, Mandl, Hankinson, & Grodstein, 2004). In most studies these benefits have been seen in women who breastfeed longer than 6 months.

Challenges to Breastfeeding

However, 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 (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. However, 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. In addition, not all women may be able to breastfeed. Women with HIV are routinely discouraged from breastfeeding as the infection may pass to the infant. Similarly, women who are taking certain medications or undergoing radiation treatment may be told not to breastfeed (USDHHS, 2011).

Cost of Breastfeeding

In addition to the nutritional benefits of breastfeeding, breast milk does not have to be purchased. Anyone who has priced formula recently can appreciate this added incentive to breastfeeding. Prices for a year’s worth of formula and feeding supplies can cost well over $1,500 (USDHHS, 2011).

But there are also those who challenge the belief that breast milk is free. For breastmilk to be completely beneficial for infants the mother's life choices will ultimately affect the quality of the nutrition an infant will receive. Let's consider the nutritional intake of

the mother. Breastfeeding will both limit some food and drink choices as well as necessitate an increased intake of healthier options. A simple trip down the supermarket aisles will show you that nutritious and healthier options can be more expensive than some of the cheaper more processed options. A large variety of vegetable and fruits must be consumed, accompanied by the right proportions and amounts of the whole grains, dairy products, and fat food groups. Additionally, it is also encouraged for breastfeeding mothers to take vitamins regularly. That raises the question of how free breastfeeding truly is.

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. By the 1950s, it was practiced less frequently as formula began to be viewed as superior to breast milk.

In the late 1960s and 1970s, greater emphasis began to be 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, women 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 to get used 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 baby and mother are comfortable with the feeding. 33

Alternatives to Breastfeeding

There are many reasons that mothers struggle to breastfeed or should not breastfeed, including: low milk supply, previous breast surgeries, illicit drug use, medications, infectious disease, and inverted nipples. Other mothers choose not to breastfeed. Some reasons for this include: lack of personal comfort with nursing, the time commitment of nursing, inadequate or unhealthy diet, and wanting more convenience and flexibility with who and when an infant can be fed. For these mothers and infants, formula is available. Besides breast milk, infant formula is the only other milk product that the medical community considers nutritionally acceptable for infants under the age of one year (as opposed to cow's milk, goat's milk, or follow-on formula). It can be used in addition to breastfeeding (supplementing) or as an alternative to breastmilk.

The most commonly used infant formulas contain purified cow's milk whey and casein as a protein source, a blend of vegetable oils as a fat source, lactose as a carbohydrate source, a vitamin-mineral mix, and other ingredients depending on the manufacturer. In addition, there are infant formulas which use soybeans as a protein source in place of cow's milk (mostly in the United States and Great Britain) and formulas which use protein hydrolysed into its component amino acids for infants who are allergic to other proteins34.

Figure 4.7.2: A father bottle-feeding his infant. (Image by Ilya Haykinson is licensed under CC BY-SA 2.0)

One early argument given to promote the practice of breastfeeding was that it promoted bonding and healthy emotional development for infants. However, this does not seem to be the 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.

When, What, and How to Introduce Solid Foods

The American Academy of Pediatrics recommends children be introduced to foods other than breast milk or infant formula when they are about 6 months old. Every child is different. Here are some signs that show that an infant is ready for foods other than breast milk or infant formula:

- Child can sit with little or no support.
- Child has good head control.
- Child opens his or her mouth and leans forward when food is offered.

How Should Foods Be Introduced?

The American Academy of Pediatrics says that for most children, foods do not need to be given in a certain order. Children can begin eating solid foods at about 6 months old. By the time they are 7 or 8 months old, children can eat a variety of foods from different food groups. These foods include infant cereals, meat or other proteins, fruits, vegetables, grains, yogurts and cheeses, and more.

If feeding infant cereals, it is important to offer a variety of fortified infant cereals such as oat, barley, and multi-grain instead of only rice cereal. The Food and Drug Administration does not recommend only providing infant rice cereal because there is a risk for children to be exposed to arsenic.

Children should be allowed to try one food at a time at first and there should be 3 to 5 days before another food is introduced. This helps caregivers see if the child has any problems with that food, such as food allergies.

Figure 4.7.3: A baby being fed solid food. (Image by Ben_Kerckx on Pixabay)

The eight most common allergenic foods are milk, eggs, fish, shellfish, tree nuts, peanuts, wheat, and soybeans. It is no longer recommended that caregivers delay introducing these foods to all children, but if there is a family history of food allergies, the child's doctor or nurse should be consulted. 37

It may take numerous attempts before a child gains a taste for it. So caregivers should not give up if a food is refused on the first offering.

USDA Infant Meal Patterns

The United States Department of Agriculture Food and Nutrition Service provides the following guidance for the day time feeding of infants and toddlers.

Table 4.7.1: Infant Meal Patterns (Infant Meals by the USDA is in the public domain)

Meal	0-5 months	6-11 months
Breakfast	4-6 fluid ounces breastmilk or formula	6-8 fluid ounces breastmilk or formula 0-4 tablespoons infant cereal, meat, fish, poultry, whole eggs, cooked dry beans or peas; or 0-2 ounces cheese; or 0-4 ounces (volume) cottage cheese; or 0-4 ounces yogurt; or a combination* 0-2 tablespoons vegetable, fruit, or both*
Lunch or Supper	4-6 fluid ounces breastmilk or formula	6-8 fluid ounces breastmilk or formula 0-4 tablespoons infant cereal, meat, fish, poultry, whole eggs, cooked dry beans or peas; or 0-2 ounces cheese; or 0-4 ounces (volume) cottage cheese; or 0-4 ounces yogurt; or a combination* 0-2 tablespoons vegetable, fruit, or both*
Snack	4-6 fluid ounces breastmilk or formula	2-4 fluid ounces breastmilk or formula 0-1⁄2 bread slice; or 0-2 crackers; or 0-4 tablespoons infant cereal or ready-to-eat cereal* 0-2 tablespoons vegetable, fruit, or both*

*Required when infant is developmentally ready. All serving sizes are minimum quantities of the food components that are required to be served.

Table 4.7.2: Meal Patterns for Children (1-2 years) (Child and Adult Meals by the USDA is in the public domain)

Meal	Ages 1-2
Breakfast	1⁄2 cup milk 1⁄4 cup vegetables, fruit, or both 1⁄2 ounce equivalent grains
Lunch or Supper	1⁄2 cup milk 1-ounce meat or meat alternative 1/8 cup vegetables 1/8 cup fruits 1⁄2 ounce equivalent of grains
Snack	Select two of the following: 1⁄2 cup of milk 1⁄2 ounce meat or meat alternative 1⁄2 cup vegetables 1⁄2 cup fruit 1⁄2 ounce equivalent of grains

Note: All serving sizes are minimum quantities of the food components that are required to be served.

Child Malnutrition

There can be serious effects for children when there are deficiencies in their nutrition. Let's explore a few types of nutritional concerns.

Wasting

Children in developing countries and countries experiencing the harsh conditions of war are at risk for two major types of malnutrition, also referred to as wasting. 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.

Around the world the rates of wasting have been dropping. However, according to the World Health Organization and UNICEF, in 2014 there were 50 million children under the age of five that experienced these forms of wasting, and 16 million were severely wasted (UNICEF, 2015). Worldwide, these figures indicate that nearly 1 child in every 13 suffers from some form of wasting. The majority of these children live in Asia (34.3 million) and Africa (13.9 million). Wasting can occur as a result of severe food shortages, regional diets that lack certain proteins and vitamins, or infectious diseases that inhibit appetite (Latham, 1997).

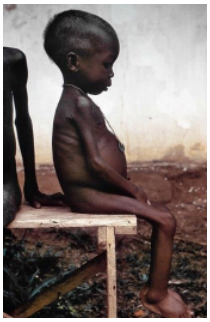

Figure 4.7.4: A child suffering from wasting. (Image by the CDC is in the public domain)

The consequences of wasting depend on how late in the progression of the disease parents and guardians seek medical treatment for their children. Unfortunately, in some cultures families do not seek treatment early, and as a result by the time a child is hospitalized the child often dies within the first three days after admission (Latham, 1997). Several studies have reported long-term cognitive effects of early malnutrition (Galler & Ramsey, 1989; Galler, Ramsey, Salt & Archer, 1987; Richardson, 1980), even when home environments were controlled (Galler, Ramsey, Morley, Archer & Salt, 1990). Lower IQ scores (Galler et al., 1987), poor attention (Galler & Ramsey, 1989), and behavioral issues in the classroom (Galler et al., 1990) have been reported in children with a history of serious malnutrition in the first few years of life. 41

Milk Anemia

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. This can be due to the practice of giving toddlers milk as a pacifier-when resting, when riding, when waking, 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. Many preschools and daycare centers give toddlers a drink after they have finished their meal in order to prevent spoiling their appetites. 42

Failure to Thrive

Failure to thrive (FTT) occurs in children whose nutritional intake is insufficient for supporting normal growth and weight gain. FTT typically presents before two years of age, when growth rates are highest. Parents may express concern about picky eating habits, poor weight gain, or smaller size compared relative to peers of similar age. Physicians often identify FTT during routine office visits, when a child's growth parameters are not tracking appropriately on growth curves.

FTT can be caused by physical or mental issues within the child (such as errors of metabolism, acid reflux, anemia, diarrhea, Cystic fibrosis, Crohn's disease, celiac disease, cleft palate, tongue tie, milk allergies, hyperthyroidism, congenital heart disease, etc.) It can also be caused by caregiver's actions (environmental), including inability to produce enough breastmilk, inadequate food supply, providing an insufficient number of feedings, and neglect. These causes may also co-exist. For instance, a child who is not getting sufficient nutrition may act content so that caregivers do not offer feedings of sufficient frequency or volume, and a child with severe acid reflux who appears to be in pain while eating may make a caregiver hesitant to offer sufficient feedings.43

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4.8: Health

Infants depend on the adults that care for them to promote and protect their health. The following section addresses common physical conditions that can affect infants, the danger of shaking babies, and the importance of immunizations.

Common Physical Conditions and Issues during Infancy

Some physical conditions and issues are very common during infancy. Many are normal, and the infant's caregivers can deal with them if they occur. Mostly, it is a matter of the caregivers learning about what is normal for their infant and getting comfortable with the new routine in the household. New parents and caregivers often have questions about the following:

- Bowel Movements
- Colic
- Diaper Rash
- Spitting Up/Vomiting
- Teething
- Urination
- Jaundice

Bowel Movements

Infants' bowel movements go through many changes in color and consistency, even within the first few days after birth. While the color, consistency, and frequency of stool will vary, hard or dry stools may indicate dehydration and increased frequency of watery stools may indicate diarrhea.

Figure 4.8.1: An infant getting their diaper changed. (Image by Kevin Phillips is licensed under CC BY 2.0)

Colic

Many infants are fussy in the evenings, but if the crying does not stop and gets worse throughout the day or night, it may be caused by colic. According to the American Academy of Pediatrics, about one-fifth of all infants develop colic, usually starting between 2 and 4 weeks of age. They may cry inconsolably or scream, extend or pull up their legs, and pass gas. Their stomachs may be enlarged. The crying spells can occur anytime, although they often get worse in the early evening.

The colic will likely improve or disappear by the age of 3 or 4 months. There is no definite explanation for why some infants get colic. Health care providers can help ensure there is no medical reason behind the crying.

Some infants seem to be soothed by being held, rocked, or wrapped snugly in a blanket. Some like a pacifier.

Figure 4.8.2: A father holding a crying infant. (Image by David D is licensed under CC BY 2.0)

Shaken Baby Syndrome

Here is a PSA from the Center for Disease Control (CDC) *The crying. The late-night feedings. The diaper changes. The exhaustion. If you've ever been around a baby who won't stop crying, you know there's potential to get frustrated. Focus on calming yourself and understand that you may not be able to calm your baby. It's not your fault or your baby's.46*

It's normal for healthy babies to cry and some babies cry much more than others. And they cannot always be consoled and caregivers can feel pushed to the limit. When caregivers lose control and shake a baby it can have devastating effects.

Shaken Baby Syndrome (SBS) is a severe form of physical child abuse. SBS may be caused from vigorously shaking an infant by the shoulders, arms, or legs. The "whiplash" effect can cause intracranial (within the brain) or intraocular (within the eyes) bleeding. Often there is no obvious external head trauma. Still, children with SBS may display some outward signs:

- Change in sleeping pattern or inability to be awakened
- Confused, restless, or agitated state
- Convulsions or seizures
- Loss of energy or motivation
- Slurred speech
- Uncontrollable crying
- Inability to be consoled
- Inability to nurse or eat

SBS can result in death, mental retardation or developmental delays, paralysis, severe motor dysfunction, spasticity, blindness, and seizures.

Who's at Risk? Small children are especially vulnerable to this type of abuse. Their heads are large in comparison to their bodies, and their neck muscles are weak. Children under one year of age are at highest risk, but SBS has been reported in children up to five years of age. Shaking often occurs in response to a baby crying or having a toilet-training accident. The perpetrator tends to be male and is primarily the biological father or the mother's boyfriend or partner. Caregivers are responsible for about 9%-21% of cases. The explanation typically provided by the caregiver—"I was playing with the baby"—does not begin to account for the severity of trauma. Many times there is also a history of child abuse.

Can It Be Prevented? SBS is completely preventable. However, it is not known whether educational efforts will effectively prevent this type of abuse. Home visitation programs are shown to prevent child abuse in general. Because the child's father or the mother's partner often causes SBS, they should be included in home visitation programs. Home visits bring community resources to families in their homes. Health professionals provide information, healthcare, psychological support, and other services that can help people to be more effective parents and care-givers.

The Bottom Line

- Shaking a baby can cause death or permanent brain damage. It can result in life-long disability.
- Healthy strategies for dealing with a crying baby include:
  - finding the reason for the crying
  - checking for signs of illness or discomfort, such as diaper rash, teething, tight clothing;
  - feeding or burping;
  - soothing the baby by rubbing its back; gently rocking; offering a pacifier;
  - singing or talking;
  - taking a walk using a stroller or a drive in a properly-secured car seat;
  - or calling the doctor if sickness is suspected
- All babies cry. Caregivers often feel overwhelmed by a crying baby. Calling a friend, relative, or neighbor for support or assistance lets the caregiver take a break from the situation. If immediate support is not available, the caregiver could place the baby in a crib (making sure the baby is safe), close the door, and check on the baby every five minutes.47

Figure 4.8.3: Medical professionals caring for an infant. (Image by the U.S. Air Force is in the public domain)

Abusive Head Trauma Shaken baby syndrome is part abusive head trauma (AHT), severe form of physical child abuse that results in an injury to the brain of a child. This is important to note because:

- Abusive head trauma is a leading cause of physical child abuse deaths in children under 5 in the United States.
- Abusive head trauma accounts for approximately one third of all child maltreatment deaths.
- The most common trigger for abusive head trauma is inconsolable crying.
- Babies less than one year old are at greatest risk of injury from abusive head trauma.49

Teething

Although newborns usually have no visible teeth, baby teeth begin to appear generally about 6 months after birth. During the first few years, all 20 baby teeth will push through the gums, and most children will have their full set of these teeth in place by age 3.

An infant's front four teeth usually appear first, at about 6 months of age, although some children don't get their first tooth until 12-14 months. As their teeth break through the gums, some infants become fussy, and irritable; lose their appetite; or drool more than usual.

The FDA does not recommend gum-numbing medications with an ingredient called benzocaine because they can cause a potentially fatal condition in young children. Safe forms of relief include a chilled teething ring or gently rubbing the child's gums with a clean finger.

Spitting Up/Vomiting

Spitting up is a common occurrence for young infants and is usually not a sign of a more serious problem. But if an infant is not gaining weight or shows other signs of illness, a health care provider should be consulted.

Figure 4.8.4: A father holding his baby with a cloth protecting his shoulder from spit-up. (Image by Colin is licensed under CC BY 2.0)

Urination

Infants urinate as often as every 1 to 3 hours or as infrequently as every 4 to 6 hours. In case of sickness or if the weather is very hot, urine output might drop by half and still be normal. If an infant shows any signs of distress while urinating or if any blood is found in a wet diaper medical care should be sought.

Diaper Rash

A rash on the skin covered by a diaper is quite common. It is usually caused by irritation of the skin from being in contact with stool and urine. It can get worse during bouts of diarrhea. Diaper rash usually can be prevented by frequent diaper changes.

Jaundice

Jaundice can cause an infant's skin, eyes, and mouth to turn a yellowish color. The yellow color is caused by a buildup of bilirubin, a substance that is produced in the body during the normal process of breaking down old red blood cells and forming new ones.

Normally the liver removes bilirubin from the body. But, for many infants, in the first few days after birth, the liver is not yet working at its full power. As a result, the level of bilirubin in the blood gets too high, causing the infant's color to become slightly yellow—this is jaundice. Although jaundice is common and usually not serious, in some cases, high levels of bilirubin could cause brain injury. All infants with jaundice need to be seen by a health care provider. Many infants need no treatment. Their livers start to catch up quickly and begin to remove bilirubin normally, usually within a few days after birth. For some infants, health care providers prescribe phototherapy—a treatment using a special lamp—to help break down the bilirubin in their bodies.

Figure 4.8.5: An infant receiving treatment for jaundice. (Image by Andres and Antoinette Ricardo used with permission)

Protecting Health through Immunization

One way we can protect a child's health (and those around them) is through immunization. The vaccines (given through injection) may hurt a little...but the diseases they can prevent can hurt a lot more! Immunization shots, or vaccinations, are essential. They protect against things like measles, mumps, rubella, hepatitis B, polio, diphtheria, tetanus and pertussis (whooping cough). Immunizations are important for adults as well as for children. Here's why.

The immune system helps the human body fight germs by producing substances to combat them. Once it does, the immune system "remembers" the germ and can fight it again. Vaccines contain germs that have been killed or weakened. When given to a healthy person, the vaccine triggers the immune system to respond and thus build immunity.

Before vaccines, people became immune only by actually getting a disease and surviving it. Immunizations are an easier and less risky way to become immune.

Vaccines are the best defense we have against serious, preventable, and sometimes deadly contagious diseases. Vaccines are some of the safest medical products available, but like any other medical product, there may be risks. Accurate information about the value of vaccines as well as their possible side effects helps people to make informed decisions about vaccination.

Figure 4.8.6: A nurse giving an infant vaccinations. (Image by Maria Immaculata Hospital is licensed under CC BY-SA 4.0)

Potential Side Effects

Vaccines, like all medical products, may cause side effects in some people. Most of these side effects are minor, such as redness or swelling at the injection site. Read further to learn about possible side effects from vaccines.

Any vaccine can cause side effects. For the most part these are minor (for example, a sore arm or low-grade fever) and go away within a few days.53 Serious side effects after vaccination, such as severe allergic reaction, are very rare.54

Remember, vaccines are continually monitored for safety, and like any medication, vaccines can cause side effects. However, a decision not to immunize a child also involves risk and could put the child and others who come into contact with him or her at risk of contracting a potentially deadly disease.

How Well Do Vaccines Work?

Vaccines work really well. No medicine is perfect, of course, but most childhood vaccines produce immunity about 90–100% of the time.

What about the argument made by some people that vaccines don't work that well . . . that diseases would be going away on their own because of better hygiene or sanitation, even if there were no vaccines?

That simply isn't true. Certainly better hygiene and sanitation can help prevent the spread of disease, but the germs that cause disease will still be around, and as long as they are they will continue to make people sick.

All vaccines must be licensed (approved) by the Food and Drug Administration (FDA) before being used in the United States, and a vaccine must go through extensive testing to show that it works and that it is safe before the FDA will approve it. Among these tests are clinical trials, which compare groups of people who get a vaccine with groups of people who get a control. A vaccine is approved only if FDA makes the determination that it is safe and effective for its intended use.

If you look at the history of any vaccine-preventable disease, you will virtually always see that the number of cases of disease starts to drop when a vaccine is licensed. Vaccines are the most effective tool we have to prevent infectious diseases.

Opposition to Vaccines

In 2010, a pertussis (whooping cough) outbreak in California sickened 9,143 people and resulted in 10 infant deaths: the worst outbreak in 63 years (Centers for Disease Control 2011b). Researchers, suspecting that the primary cause of the outbreak was the waning strength of pertussis vaccines in older children, recommended a booster vaccination for 11–12-year-olds and also for pregnant women (Zacharyczuk 2011). Pertussis most serious for babies; one in five needs to be hospitalized, and since they are too young for the vaccine themselves, it is crucial that people around them be immunized (Centers for Disease Control 2011b). Several states, including California, have been requiring the pertussis booster for older children in recent years with the hope of staving off another outbreak.

But what about people who do not want their children to have this vaccine, or any other? That question is at the heart of a debate that has been simmering for years. Vaccines are biological preparations that improve immunity against a certain disease. Vaccines have contributed to the eradication and weakening of numerous infectious diseases, including smallpox, polio, mumps, chicken pox, and meningitis.

Figure 4.8.7: These two young children contracted polio. (Image by the CDC is in the public domain)

However, many people express concern about potential negative side effects from vaccines. These concerns range from fears about overloading the child's immune system to controversial reports about devastating side effects of the vaccines.56

Although children continue to get several vaccines up to their second birthday, these vaccines do not overload the immune system. Every day, an infant's healthy immune system successfully fights off thousands of antigens – the parts of germs that cause their immune system to respond. Even if your child receives several vaccines in one day, vaccines contain only a tiny amount of antigens compared to the antigens your baby encounters every day.

This is the case even if your child receives combination vaccines. Combination vaccines take two or more vaccines that could be given individually and put them into one shot. Children get the same protection as they do from individual vaccines given separately—but with fewer shots.57

One misapprehension is that the vaccine itself might cause the disease it is supposed to be immunizing against.58 Vaccines help develop immunity by imitating an infection, but this "imitation" infection does not cause illness. Instead it causes the immune system to develop the same response as it does to a real infection so the body can recognize and fight the vaccine-preventable disease in the future. Sometimes, after getting a vaccine, the imitation infection can cause minor symptoms, such as fever. Such minor symptoms are normal and should be expected as the body builds immunity.59

Another commonly circulated concern is that vaccinations, specifically the MMR vaccine (MMR stands for measles, mumps, and rubella), are linked to autism. The autism connection has been particularly controversial. In 1998, a British physician named Andrew Wakefield published a study in Great Britain's Lancet magazine that linked the MMR vaccine to autism. The report received a lot of media attention, resulting in British immunization rates decreasing from 91 percent in 1997 to almost 80 percent by 2003, accompanied by a subsequent rise in measles cases (Devlin 2008). A prolonged investigation by the British Medical Journal proved that not only was the link in the study nonexistent, but that Dr. Wakefield had falsified data in order to support his claims (CNN 2011). Dr. Wakefield was discredited and stripped of his license, but the doubt still lingers in many parents' minds.

In the United States, many parents still believe in the now discredited MMR-autism link and refuse to vaccinate their children. Other parents choose not to vaccinate for various reasons like religious or health beliefs. In one instance, a boy whose parents opted not to vaccinate returned home to the U.S. after a trip abroad; no one yet knew he was infected with measles.

The boy exposed 839 people to the disease and caused 11 additional cases of measles, all in other unvaccinated children, including one infant who had to be hospitalized.

Figure 4.8.8: A baby with measles (Image by CDC Global is licensed under CC BY 2.0)

According to a study published in Pediatrics (2010), the outbreak cost the public sector $10,376 per diagnosed case. The study further showed that the intentional non-vaccination of those infected occurred in students from private schools, public charter schools, and public schools in upper-socioeconomic areas (Sugerman et al. 2010).61

The Immunization Schedule

On-time vaccination throughout childhood is essential because it helps provide immunity before children are exposed to potentially life-threatening diseases. Vaccines are tested to ensure that they are safe and effective for children to receive at the recommended ages.62 Fully vaccinated children in the U.S. are protected against sixteen potentially harmful diseases. Vaccine-preventable diseases can be very serious, may require hospitalization, or even be deadly — especially in infants and young children.63

Here is the schedule from the CDC to ensure a child is fully vaccinated:

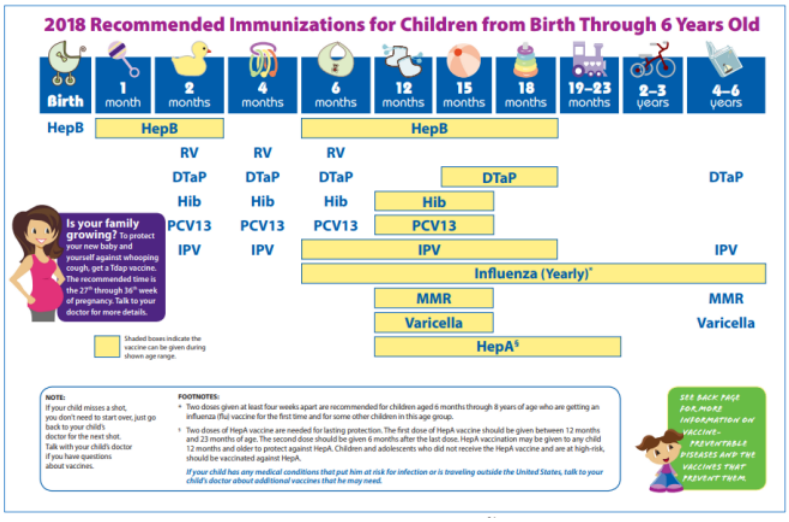

Figure 4.8.9: Immunization schedule. (Image by the CDC is in the public domain)

Vaccine-Preventable Diseases and the Vaccines that Prevent Them

Disease	Vaccine	Disease spread by	Disease symptoms	Disease complications
Chickenpox	Varicella vaccine protects against chickenpox.	Air, direct contact	Rash, tiredness, headache, fever	Infected blisters, bleeding disorders, encephalitis (brain swelling), pneumonia (infection in the lungs)
Diphtheria	DTaP* vaccine protects against diphtheria.	Air, direct contact	Sore throat, mild fever, weakness, swollen glands in neck	Swelling of the heart muscle, heart failure, coma, paralysis, death
Hib	Hib vaccine protects against *Haemophilus influenzae* type b.	Air, direct contact	May be no symptoms unless bacteria enter the blood	Meningitis (infection of the covering around the brain and spinal cord), intellectual disability, epiglottitis (life-threatening infection that can block the windpipe and lead to serious breathing problems), pneumonia (infection in the lungs), death
Hepatitis A	HepA vaccine protects against hepatitis A.	Direct contact, contaminated food or water	May be no symptoms, fever, stomach pain, loss of appetite, fatigue, vomiting, jaundice (yellowing of skin and eyes), dark urine	Liver failure, arthralgia (joint pain), kidney, pancreatic, and blood disorders
Hepatitis B	HepB vaccine protects against hepatitis B.	Contact with blood or body fluids	May be no symptoms, fever, headache, weakness, vomiting, jaundice (yellowing of skin and eyes), joint pain	Chronic liver infection, liver failure, liver cancer
Influenza (Flu)	Flu vaccine protects against influenza.	Air, direct contact	Fever, muscle pain, sore throat, cough, extreme fatigue	Pneumonia (infection in the lungs)
Measles	MMR** vaccine protects against measles.	Air, direct contact	Rash, fever, cough, runny nose, pinkeye	Encephalitis (brain swelling), pneumonia (infection in the lungs), death
Mumps	MMR**vaccine protects against mumps.	Air, direct contact	Swollen salivary glands (under the jaw), fever, headache, tiredness, muscle pain	Meningitis (infection of the covering around the brain and spinal cord) , encephalitis (brain swelling), inflammation of testicles or ovaries, deafness
Pertussis	DTaP* vaccine protects against pertussis (whooping cough).	Air, direct contact	Severe cough, runny nose, apnea (a pause in breathing in infants)	Pneumonia (infection in the lungs), death
Polio	IPV vaccine protects against polio.	Air, direct contact, through the mouth	May be no symptoms, sore throat, fever, nausea, headache	Paralysis, death
Pneumococcal	PCV13 vaccine protects against pneumococcus.	Air, direct contact	May be no symptoms, pneumonia (infection in the lungs)	Bacteremia (blood infection), meningitis (infection of the covering around the brain and spinal cord), death
Rotavirus	RV vaccine protects against rotavirus.	Through the mouth	Diarrhea, fever, vomiting	Severe diarrhea, dehydration
Rubella	MMR** vaccine protects against rubella.	Air, direct contact	Children infected with rubella virus sometimes have a rash, fever, swollen lymph nodes	Very serious in pregnant women—can lead to miscarriage, stillbirth, premature delivery, birth defects
Tetanus	DTaP* vaccine protects against tetanus.	Exposure through cuts in skin	Stiffness in neck and abdominal muscles, difficulty swallowing, muscle spasms, fever	Broken bones, breathing difficulty, death

* DTaP combines protection against diphtheria, tetanus, and pertussis.
** MMR combines protection against measles, mumps, and rubella.

Last updated August 2018 – CS265321-A

Figure 4.8.10: Vaccine-Preventable Diseases. (Image by the CDC is in the public domain)

Safety

There are different risks to infant safety. According to the CDC, nonfatal injury rates varied by age group.

- Nonfatal suffocation rates were highest for those less than 1 year of age.
- Rates for fires or burns, and drowning were highest for children 4 years and younger.
- Children 1 to 4 years of age had the highest rates of nonfatal falls and poisoning.

And the leading causes of injury death also differed by age group.

- For children less than 1 year of age, two–thirds of injury deaths were due to suffocation.
- Drowning was the leading cause of injury or death for those 1 to 4 years of age.66

car seat safety

Motor vehicle injuries are a leading cause of death among children in the United States. But many of these deaths can be prevented.

- In the United States, 723 children ages 12 years and younger died as occupants in motor vehicle crashes during 2016, and more than 128,000 were injured in 2016.
- One CDC study found that, in one year, more than 618,000 children ages 0-12 rode in vehicles without the use of a child safety seat or booster seat or a seat belt at least some of the time.
- Of the children ages 12 years and younger who died in a crash in 2016 (for which restraint use was known), 35% were not buckled up.67

Buckling children in age- and size-appropriate car seats, booster seats, and seat belts reduces the risk of serious and fatal injuries:

- Car seat use reduces the risk of injury in a crash by 71-82% for children when compared to seat belt use alone.
- Booster seat use reduces the risk for serious injury by 45% for children aged 4–8 years when compared with seat belt use alone.
- For older children and adults, seat belt use reduces the risk of death and serious injury by approximately half.68

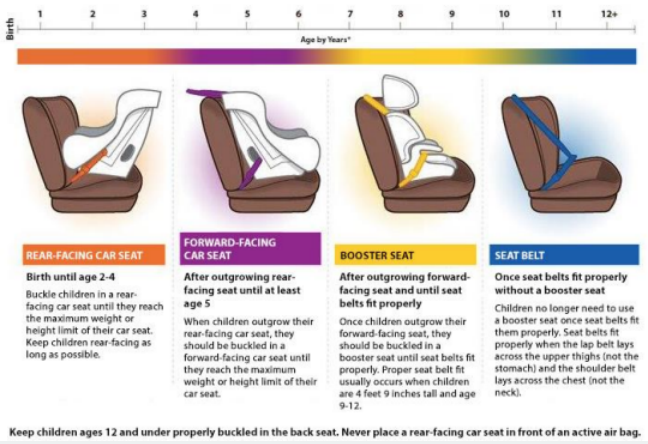

Figure 4.8.11: The different types of car seats based on age. (Image by the CDC is in the public domain)

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4.9: Sleep

A newborn typically sleeps approximately 16.5 hours per 24-hour period. This is usually polyphasic sleep in that the infant is accumulating the 16.5 hours over several sleep periods throughout the day (Salkind, 2005). The infant is averaging 15 hours per 24-hour period by one month, and 14 hours by 6 months. By the time children turn two, they are averaging closer to 10 hours per 24 hours. Additionally, the average newborn will spend close to 50% of the sleep time in the Rapid Eye Movement (REM) phase, which decreases to 25% to 30% in childhood.70

Sudden Infant Death Syndrome and Safe Sleep

Sudden Infant Death Syndrome (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 1 to 12 months old, and approximately 1,500 infants died of SIDS in 2013 (CDC, 2015). 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).71

Figure 4.9.1: A baby sleeping safely. (Image by the U.S. Department of Health and Human Services is in the public domain)

Risk Factors Babies are at higher risk for SIDS if they:

- Sleep on their stomachs
- Sleep on soft surfaces, such as an adult mattress, couch, or chair or under soft coverings
- Sleep on or under soft or loose bedding
- Get too hot during sleep.
- Are exposed to cigarette smoke in the womb or in their environment, such as at home, in the car, in the bedroom, or other areas
- Sleep in an adult bed with parents, other children, or pets; this situation is especially dangerous if:
  - The adult smokes, has recently had alcohol, or is tired.
  - The baby is covered by a blanket or quilt.
  - The baby sleeps with more than one bed-sharer.
  - The baby is younger than 11 to 14 weeks of age.

Reducing the Risks There have been dramatic improvements in reducing baby deaths during sleep since the 1990s, when recommendations were introduced to place babies on their back for sleep. However, since the late 1990s, declines have slowed.

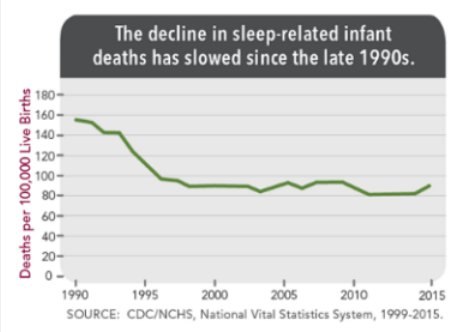

Figure 4.9.2: A graph showing the decline in sleep-related infant deaths. (Image by the CDC is in the public domain)

In 2012, the Back to Sleep campaign became the Safe to Sleep campaign. Safe to Sleep aims to educate all caregivers about SIDS and safe sleep practices. Current recommendations to reduce the risk of SIDS and other sleep-related causes of infant death:

- Always place baby on his or her back to sleep (for naps and at night).
- Use a firm and flat surface.
- Use only a tight fitting sheet on the sleep surface; no other bedding or soft items in the sleep area.
- Breastfeed.
- Share your room with a baby, but on a separate surface designed for infants (not your bed).
- Do not put soft objects, toys, crib bumpers, or loose bedding under, over, or anywhere near baby's sleep area.
- Do no smoke during pregnancy or allow smoking around baby.
- Consider giving baby a pacifier.
- Do not let baby get too hot during sleep.
- Get regular health care (including vaccines).
- Avoid products that go against safe sleep recommendations, especially those that claim to prevent or reduce the risk of SIDS.
- Do not use heart or breathing monitors to reduce the risk of SIDS. 74

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4.S: Summary

In this chapter we looked at:

- Physical changes during the first two years
- Some common infant reflexes
- How fine and gross motor skills develop
- Sensory capacities during the first two years
- Health and safety for infants and toddlers
- The sleep needs during the first two years and ways to reduce the risk of SIDS

In the next chapter we are going to be taking a closer look at theories that help us explain the cognitive and language development during infancy and toddlerhood.

5: COGNITIVE DEVELOPMENT IN INFANCY AND TODDLERHOOD

Paris, Ricardo, Raymond, & Johnson
College of the Canyons

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CHAPTER OVERVIEW

5: Cognitive Development in Infancy and Toddlerhood

Learning Objectives

After this chapter, you should be able to:

1. Describe the substages of the Piaget's sensorimotor stage.
2. Explain how the social environment affects cognitive development according to Vygotsky's theory.
3. Discuss the progression of language development during the first two years.
4. Compare the theories of language development.
5. Define classical and operant conditioning.
6. Summarize the different types of memory

In an effort to better understand the large spectrum of cognition that infants and toddlers go through, it is important to analyze and comprehend various theories that relate to their growth and development. This chapter will take a look at the following theorists: Piaget, Vygotsky, Chomsky, Skinner, Pavlov, Watson, Bandura, and Bronfenbrenner.

Thumbnail: pixabay.com/photos/music-kid...ophone-818459/

5.1: Piaget

Jean Piaget is the most noted theorist when it comes to children's cognitive development. He believed that children's cognition develops in stages. He explained this growth in the following stages:

1. Sensory Motor Stage (Birth through 2 years old)
2. Preoperational Stage (2-7 years old)
3. Concrete Operational Stage (7-11 years old)
4. Formal Operational Stage (12 years old- adulthood)

In this cognitive chapter we will focus on his first stage which occurs in infancy.[1]

Piaget and Sensorimotor Intelligence

Piaget describes intelligence in infancy as **sensorimotor** or based on direct, physical contact. Infants taste, feel, pound, push, hear, and move in order to experience the world. Let's explore the transition infants make from responding to the external world reflexively as newborns to solving problems using mental strategies as two years old.

Table 5.1.1: Substages of Piaget's Sensorimotor Stage[2]

Substage	Age	Description
Substage One: Simple Reflexes	Birth to 1 month	This active learning begins with automatic movements or reflexes. A ball comes into contact with an infant's cheek and is automatically sucked on and licked.
Substage Two: Primary Circular Reactions	1 to 4 months	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. At first, most actions have to do with the body, but in months to come, will be directed more toward objects.
Substage Three: Secondary Circular Reactions	4 to 8 months	The infant becomes more and more actively engaged in the outside world and takes delight in being able to make things happen. Repeated motion brings particular interest as the infant is able to bang two lids together from the cupboard when seated on the kitchen floor.
Substage Four: Coordination of circular reactions	8 to 12 months	The infant can engage in behaviors that others perform and anticipate upcoming events. 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. The object continues to exist in the infant's mind even when out of sight and the infant now is capable of making attempts to retrieve it.

Substage	Age	Description
Substage Five: Tertiary Circular Reactions	12 to 18 months	The infant more actively engages in experimentation to learn about the physical 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!
Substage Six: Internalization of Schemes and Early Representational thought	18 months to 2 years	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 in vain to push the door or turn the doorknob, the child carries out a mental strategy learned from prior experience to get the door opened-he knocks on the door! The child is now better equipped with mental strategies for problem- solving.

Figure 5.1.1: An infant sitting in a highchair. (Image by holycalamity is licensed under CC BY-SA 2.0)

Evaluating Piaget's Sensorimotor Stage

Piaget opened up a new way of looking at infants with his view that their main task is to coordinate their sensory impressions with their motor activity. However, the infant's cognitive world is not as neatly packaged as Piaget portrayed it, and some of Piaget's explanations for the cause of change are debated. In the past several decades, sophisticated experimental techniques have been devised to study infants, and there have been a large number of research studies on infant development. Much of the new research suggests that Piaget's view of sensorimotor development needs to be modified (Baillargeon, 2014; Brooks & Meltzoff, 2014; Johnson & Hannon, 2015).

Object Permanence

One necessary modification would be to when children develop object permanence. Infants seem to be able to recognize that objects have permanence at much younger ages than Piaget proposed (even as young as 3.5 months of age).

The A-not-B Error

The data does not always support Piaget's claim that certain processes are crucial in transitions from one stage to the next. For example, in Piaget's theory, an important feature in the progression into substage 4, coordination of secondary circular reactions, is an infant's inclination to search for a hidden object in a familiar location rather than to look for the object in a new location. Thus, if a toy is hidden twice, initially at location A and subsequently at location B, 8- to 12-month-old infants search correctly at location A initially. But when the toy is subsequently hidden at location B, they make the mistake of continuing to search for it at

location A. **A-not-B error** is the term used to describe this common mistake. Older infants are less likely to make the A-not-B error because their concept of object permanence is more complete.

Researchers have found, however, that the A-not-B error does not show up consistently (Sophian, 1985). The evidence indicates that A-not-B errors are sensitive to the delay between hiding the object at B and the infant's attempt to find it (Diamond, 1985). Thus, the A-not-B error might be due to a failure in memory. Another explanation is that infants tend to repeat a previous motor behavior (Clearfield & others, 2006; Smith, 1999).

References and Attributions

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5.2: Vygotsky

Development is Determined By Environmental Factors

Piaget set the tone for much of current-day research but his theory has also received a great deal of criticism. Many believe that Piaget ignored the huge influence that society and culture have in shaping a child's development. At a similar time, another researcher named Lev Vygotsky (1896–1934) had come to similar conclusions as Piaget about children's development, in thinking that children learned about the world through physical interaction with it. However, where Piaget felt that children moved naturally through different stages of development, based on biological predispositions and their own individual interactions with the world, Vygotsky claimed that adult or peer intervention was a much more important part of the developmental process.

Vygotsky concentrated more on the child's immediate social and cultural environment and his or her interactions with adults and peers. He argued that development occurred first through children's immediate social interactions, and then moved to the individual level as they began to internalize their learning. While Piaget saw the child as actively discovering the world through individual interactions with it, Vygotsky saw the child as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities. 4

Figure 5.2.1: An adult playing Legos with a child. (Image by Tabeajaichhalt on Pixabay)

References and Attributions

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5.3: Cognitive Milestones

Children are actively learning about the world as they perceive it from the time they are in the womb. Here is a table of some of the cognitive milestones infants and toddlers typically develop.

Table 5.3.1: Cognitive Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do by This Age
2 months	• Pays attention to faces • Begins to follow things with eyes and recognize people at a distance • Begins to act bored (cries, fussy) if activity doesn't change
4 months	• Lets you know if she is happy or sad • Responds to affection • Reaches for toy with one hand • Uses hands and eyes together, such as seeing a toy and reaching for it • Follows moving things with eyes from side to side • Watches faces closely • Recognizes familiar people and things at a distance
6 months	• Looks around at things nearby • Brings things to mouth • Shows curiosity about things and tries to get things that are out of reach • Begins to pass things from one hand to the other
9 months	• Watches the path of something as it falls • Looks for things he sees you hide • Plays peek-a-boo • Puts things in mouth • Moves things smoothly from one hand to the other • Picks up things like cereal o's between thumb and index finger
1 year	• Explores things in different ways, like shaking, banging, throwing • Finds hidden things easily • Looks at the right picture or thing when it's named • Copies gestures • Starts to use things correctly; for example, drinks from a cup, brushes hair • Bangs two things together • Puts things in a container, takes things out of a container • Lets things go without help • Pokes with index (pointer) finger • Follows simple directions like "pick up the toy"
18 months	• Knows what ordinary things are for; for example, telephone, brush, spoon • Points to get the attention of others • Shows interest in a doll or stuffed animal by pretending to feed • Points to one body part • Scribbles on own • Can follow 1-step verbal commands without any gestures; for example, sits when you say "sit down"

Typical Age	What Most Children Do by This Age
2 years	• Finds things even when hidden under two or three covers • Begins to sort shapes and colors • Completes sentences and rhymes in familiar books • Plays simple make-believe games • Builds towers of 4 or more blocks • Might use one hand more than the other • Follows two-step instructions such as “Pick up your shoes and put them in the closet.” • Names items in a picture book such as a cat, bird, or dog

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5.4: Language Development

Do newborns communicate? Absolutely! However, they do not communicate with the use of language. Instead, they communicate their thoughts and needs with body posture (being relaxed or still), gestures, cries, and facial expressions. A person who spends adequate time with an infant can learn which cries indicate pain and which ones indicate hunger, discomfort, or frustration as well as translate their vocalizations, movements, gestures and facial expressions.

Figure 5.4.1: An infant looking up at the camera. (Image by Andres and Antoinette Ricardo used with permission)

Stages of Language Development

1. Intentional Vocalizations: Cooing and taking turns: Infants begin to vocalize and repeat vocalizations within the first couple of months of life. That gurgling, musical vocalization called cooing 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. Cooing initially involves making vowel sounds like "oooo". Later, consonants are added to vocalizations such as "nanananananana".

2. Babbling and gesturing: 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. 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.

3. Understanding: At around ten months of age, the infant can understand more than he or she can say. 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 to contribute to it.

4. Holophrastic speech: 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 holophrastic 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. They know that "ju" means "juice" which means the baby wants some milk! 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" which, the parent explains, means "I want some milk when I go with Daddy."

Figure 5.4.2: Two children playing with toys. (Image by the U.S. Air Force is in the public domain)

5. Underextension: 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. Only the family's Irish Setter is a "doggie". This is referred to as underextension. More often, however, a child may think that a label applies to all objects that are similar to the original object. In overextension all animals become "doggies", for example.

6. First words and cultural influences: First words if the child is using English tend to be nouns. The child labels objects such as cup or ball. 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 relationship 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.

7. Vocabulary growth spurt: One year olds typically have a vocabulary of about 50 words. But by the time they become toddlers, they have a vocabulary of about 200 words and begin putting those words together in telegraphic speech (I think of it now as 'text message' speech because texting is more common and is similar in that text messages typically only include the minimal amount of words to convey the message).

8. Two word sentences and telegraphic speech: Words are soon combined and 18 month old toddlers can express themselves further by using expressions 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) where unnecessary words are not used. "Give baby ball" is used rather than "Give the baby the ball." Or a text message of "Send money now!" rather than "Dear Mother. I really need some money to take care of my expenses."9

Figure 5.4.3: A toddler playing with a toy telephone. (Image by Salim Virji is licensed under CC BY-SA 2.0)

Language Milestones

In the first two years of life, children go from communicating by crying to being able to express themselves with words. Here is a table of common language milestones for infants and toddlers.

Table 5.4.1: Language Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do By This Age
2 months	• Coos, makes gurgling sounds • Turns head toward sounds
4 months	• Begins to babble • Babbles with expression and copies sounds he hears • Cries in different ways to show hunger, pain, or being tired
6 months	• Responds to sounds by making sounds • Strings vowels together when babbling ("ah," "eh," "oh") and likes taking turns with parent while making sounds • Responds to own name • Makes sounds to show joy and displeasure • Begins to say consonant sounds (jabbering with "m," "b")

Typical Age	What Most Children Do By This Age
9 months	• Understands “no” • Makes a lot of different sounds like “mamamama” and “bababababa” • Copies sounds and gestures of others • Uses fingers to point at things
1 year	• Responds to simple spoken requests • Uses simple gestures, like shaking head “no” or waving “bye-bye” • Makes sounds with changes in tone (sounds more like speech) • Says “mama” and “dada” and exclamations like “uh-oh!” • Tries to say words you say
18 months	• Says several single words • Says and shakes head now • Points to show others what is wanted
2 years	• Points to things or pictures when they are named • Knows names of familiar people and body parts • Says sentences with 2 to 4 words • Follows simple instructions • Repeats words overheard in conversation • Points to things in a book

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** or parentheses (historically referred to as motherese). It involves exaggerating the vowel and consonant sounds, using a high-pitched voice, and delivering the phrase with great facial expression. Why is this done? It may be in order to clearly articulate the sounds of a word so that the child can hear the sounds involved. Or it may 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 tuned with one another. [12]

Theories of Language Development

The following two theories of language development represent two extremes in the level of interaction required for language to occur (Berk, 2007).

Chomsky and the Language Acquisition Device

The view known as **nativism** advocated by Noam Chomsky suggests that infants are equipped with a neurological construct referred to as the **language acquisition device** or LAD that makes infants ready for language. Language develops as long as the infant is exposed to it. No teaching, training, or reinforcement is required for language to develop.

Social Pragmatics

Another view emphasizes the child’s active engagement in learning language out of a need to communicate. The child seeks information, memorizes terms, imitates the speech heard from others and learns to conceptualize using words as language is acquired. Many would argue that all three of these dynamics foster the acquisition of language (Berger, 2004)[13]

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5.5: Theories of Cognitive Development, Learning, and Memory

Pavlov

Ivan Pavlov (1880-1937) was a Russian physiologist interested in studying digestion. As he recorded the amount of salivation his laboratory dogs produced as they ate, he noticed that they actually began to salivate before the food arrived as the researcher walked down the hall and toward the cage. The dogs knew that the food was coming because they had learned to associate the footsteps with the food. The keyword here is “learned”. A learned response is called a “conditioned” response.

Pavlov began to experiment with this “psychic” reflex. He began to ring a bell, for instance, prior to introducing the food. Sure enough, after making this connection several times, the dogs could be made to salivate to the sound of a bell. Once the bell had become an event to which the dogs had learned to salivate, it was called a conditioned stimulus. The act of salivating to a bell was a response that had also been learned, now termed in Pavlov’s jargon, a conditioned response.

Notice that the response, salivation, is the same whether it is conditioned or unconditioned (unlearned or natural). What changed is the stimulus to which the dog salivates. One is natural (unconditioned) and one is learned (conditioned).

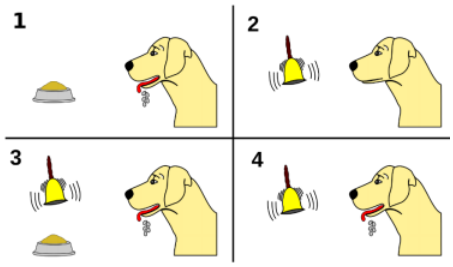

Figure 5.5.1: Pavlov’s experiments with dogs and conditioning. (Image by Maxxl² is licensed under CC BY-SA 4.0)

Let’s think about how classical conditioning is used on us. One of the most widespread applications of classical conditioning principles was brought to us by the psychologist, John B. Watson.[15]

Classical Conditioning

Classical conditioning is a form of learning whereby a **conditioned stimulus** (CS) becomes associated with an unrelated **unconditioned stimulus** (US), in order to produce a behavioral response known as a **conditioned response** (CR). The conditioned response is the learned response to the previously neutral stimulus. The unconditioned stimulus is usually a biologically significant stimulus such as food or pain that elicits an **unconditioned response** (UR) from the start. The conditioned stimulus is usually neutral and produces no particular response at first, but after conditioning, it elicits the conditioned response.

If we look at Pavlov's experiment, we can identify these four factors at work:

- The unconditioned response was the salivation of dogs in response to seeing or smelling their food.
- The unconditioned stimulus was the sight or smell of the food itself.
- The conditioned stimulus was the ringing of the bell. During conditioning, every time the animal was given food, the bell was rung. This was repeated during several trials. After some time, the dog learned to associate the ringing of the bell with food and to respond by salivating. After the conditioning period was finished, the dog would respond by salivating when the bell was rung, even when the unconditioned stimulus (the food) was absent.
- The conditioned response, therefore, was the salivation of the dogs in response to the conditioned stimulus (the ringing of the bell).[16]

Neurological Response to Conditioning

Consider how the conditioned response occurs in the brain. When a dog sees food, the visual and olfactory stimuli send information to the brain through their respective neural pathways, ultimately activating the salivary glands to secrete saliva. This reaction is a natural biological process as saliva aids in the digestion of food. When a dog hears a buzzer and at the same time sees food, the auditory stimuli activates the associated neural pathways. However, since these pathways are being activated at the same time as the other neural pathways, there are weak synapse reactions that occur between the auditory stimuli and the behavioral response. Over time, these synapses are strengthened so that it only takes the sound of a buzzer to activate the pathway leading to salivation.

Operant Conditioning

Operant conditioning is a theory of behaviorism, a learning perspective that focuses on changes in an individual's observable behaviors. In **operant conditioning theory**, new or continued behaviors are impacted by new or continued consequences. Research regarding this principle of learning was first studied by Edward L. Thorndike in the late 1800's, then brought to popularity by B.F. Skinner in the mid-1900's. Much of this research informs current practices in human behavior and interaction.

Skinner's Research

Thorndike's initial research was highly influential on another psychologist, B.F. Skinner. Almost half a century after Thorndike's first publication of the principles of operant conditioning, Skinner attempted to prove an extension to this theory—that all behaviors were in some way a result of operant conditioning. Skinner theorized that if a behavior is followed by reinforcement, that behavior is more likely to be repeated, but if it is followed by punishment, it is less likely to be repeated. He also believed that this learned association could end, or become extinct if the reinforcement or punishment was removed.

To prove this, he placed rats in a box with a lever that when tapped would release a pellet of food. Over time, the amount of time it took for the rat to find the lever and press it became shorter and shorter until finally, the rat would spend most of its time near the lever eating. This behavior became less consistent when the relationship between the lever and the food was compromised. This basic theory of operant conditioning is still used by psychologists, scientists, and educators today.

Shaping, Reinforcement Principles, and Schedules of Reinforcement

Operant conditioning can be viewed as a process of action and consequence. Skinner used this basic principle to study the possible scope and scale of the influence of operant conditioning on animal behavior. His experiments used shaping, reinforcement, and reinforcement schedules in order to prove the importance of the relationship that animals form between behaviors and results.

All of these practices concern the setup of an experiment. **Shaping** is the conditioning paradigm of an experiment. The form of the experiment in successive trials is gradually changed to elicit a desired target behavior. This is accomplished through reinforcement, or reward, of the segments of the target behavior, and can be tested using a large variety of actions and rewards. The experiments were taken a step further to include different schedules of reinforcement that become more complicated as the trials continued. By testing different reinforcement schedules, Skinner learned valuable information about the best ways to encourage a specific behavior, or the most effective ways to create a long-lasting behavior. Much of this research has been replicated on humans, and now informs practices in various environments of human behavior.[17]

Positive and Negative Reinforcement

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, negative reinforcement has been used.

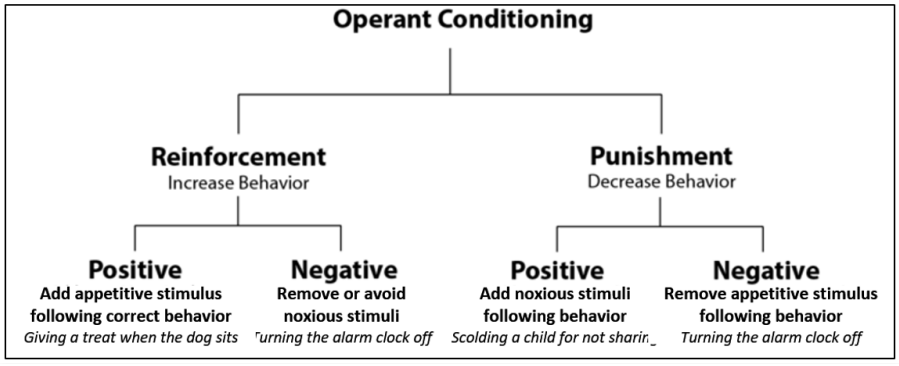

Figure 5.5.2: Reinforcement in operant conditioning. (Image by Curtis Neveu is licensed under CC BY-SA 3.0 and Modified from source image)

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 a behavior; punishers are used to stop

behavior. A **punisher** is anything that follows an act and decreases the chance it will reoccur. But often a 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. Or 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. And punishment is stigmatizing; when punished, some 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, or intermittently, after the behavior is performed a number of times or the first time it is performed after a certain amount 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. Think about the kinds of behaviors that may be learned through classical and operant conditioning. But sometimes very complex behaviors are learned quickly and without direct reinforcement. Bandura's Social Learning covered later in the chapter explains how.[19]

Watson and Behaviorism

Another theorist who added to the spectrum of the behavioral movement was John B. Watson. Watson believed that most of our fears and other emotional responses are classically conditioned. He had gained a good deal of popularity in the 1920s with his expert advice on parenting offered to the public. He believed that parents could be taught to help shape their children's behavior and tried to demonstrate the power of classical conditioning with his famous experiment with an 18 month old boy named "Little Albert". Watson sat Albert down and introduced a variety of seemingly scary objects to him: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear of loud noises so he proceeded to make a loud noise each time he introduced one of Albert's favorites, a white rat. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced.

Watson filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow his advice. Watson wrote columns in newspapers and in magazines and gained a lot of popularity among parents eager to apply science to household order. Parenting advice was not the legacy Watson left us, however. Where he really made his impact was in advertising. After Watson left academia, he went into the world of business and showed companies how to tie something that brings about a natural positive feeling to their products to enhance sales. Thus the union of sex and advertising![20] Sometimes we do things because we've seen it pay off for someone else. They were operantly conditioned, but we engage in the behavior because we hope it will pay off for us as well. This is referred to as vicarious reinforcement (Bandura, Ross and Ross, 1963).

Figure 5.5.3: A photograph taken during Little Albert research. (Image is in the public domain)

Do parents socialize children or do children socialize parents?

Bandura (1986) suggests that there is interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. There is interplay between our personality and the way we interpret events and how they influence us. This concept is called reciprocal determinism. An example of this might be the interplay between parents and children. Parents not only influence their child's environment, perhaps intentionally through the use of reinforcement, etc., but children influence parents as well. Parents may respond differently with their first child than with their fourth. Perhaps they try to be the perfect parents with their firstborn, but by the time their last child comes along they have very different expectations both of themselves and their child. Our environment creates us and we create our environment.

Figure 5.5.4: A smiling infant playing with toys. (Image by OmarMedinaFilms on Pixabay)

Social Learning Theory

Albert Bandura is a leading contributor to **social learning theory**. He calls our attention to the ways in which many of our actions are not learned through conditioning; rather, they are learned by watching others (1977). Young children frequently learn behaviors through imitation. Sometimes, particularly when we do not know what else to do, we learn by modeling or copying the behavior of others. A new employee, on his or her first day of a new job might eagerly look at how others are acting and try to act the same way to fit in more quickly. Adolescents struggling with their identity rely heavily on their peers to act as role-models. Newly married couples often rely on roles they may have learned from their parents and begin to act in ways they did not while dating and then wonder why their relationship has changed.

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5.6: Memory and Attention

If we want to remember something tomorrow, we have to consolidate it into long-term memory today. **Long-term memory** is the final, semi-permanent stage of memory. Unlike sensory and short-term memory, long-term memory has a theoretically infinite capacity, and information can remain there indefinitely. Long-term memory has also been called reference memory, because an individual must refer to the information in long-term memory when performing almost any task. Long-term memory can be broken down into two categories: explicit and implicit memory.

Explicit Memory

Explicit memory, also known as conscious or **declarative memory**, involves memory of facts, concepts, and events that require conscious recall of the information. In other words, the individual must actively think about retrieving the information from memory. This type of information is explicitly stored and retrieved—hence its name. Explicit memory can be further subdivided into **semantic memory**, which concerns facts, and episodic memory, which concerns primarily personal or autobiographical information.

Episodic Memory

Episodic memory is used for more contextualized memories. They are generally memories of specific moments, or episodes, in one's life. As such, they include sensations and emotions associated with the event, in addition to the who, what, where, and when of what happened. An example of an episodic memory would be recalling your family's trip to the beach. Autobiographical memory (memory for particular events in one's own life) is generally viewed as either equivalent to, or a subset of, episodic memory. One specific type of autobiographical memory is a flashbulb memory, which is a highly detailed, exceptionally vivid "snapshot" of the moment and circumstances in which a piece of surprising and consequential (or emotionally arousing) news was heard. For example, many people remember exactly where they were and what they were doing when they heard of the terrorist attacks on September 11, 2001. This is because it is a flashbulb memory.

Semantic and episodic memory are closely related; memory for facts can be enhanced with episodic memories associated with the fact, and vice versa. For example, the answer to the factual question "Are all apples red?" might be recalled by remembering the time you saw someone eating a green apple. Likewise, semantic memories about certain topics, such as football, can contribute to more detailed episodic memories of a particular personal event, like watching a football game. A person that barely knows the rules of football will remember the various plays and outcomes of the game in much less detail than a football expert.

Implicit Memory

In contrast to explicit (conscious) memory, **implicit** (also called "unconscious" or "procedural") **memory** involves procedures for completing actions. These actions develop with practice over time. Athletic skills are one example of implicit memory. You learn the fundamentals of a sport, practice them over and over, and then they flow naturally during a game. Rehearsing for a dance or musical performance is another example of implicit memory. Everyday examples include remembering how to tie your shoes, drive a car, or ride a bicycle. These memories are accessed without conscious awareness—they are automatically translated into actions without us even realizing it. As such, they can often be difficult to teach or explain to other people. Implicit memories differ from the semantic scripts described above in that they are usually actions that involve movement and motor coordination, whereas scripts tend to emphasize social norms or behaviors.

Figure 5.6.1: A toddler walking. (Image on Public Domain Pictures)

Short-Term Memory Storage

Short-term memory is the ability to hold information for a short duration of time (on the order of seconds). In the process of encoding, information enters the brain and can be quickly forgotten if it is not stored further in the short-term memory. George A. Miller suggested that the capacity of short-term memory storage is approximately seven items plus or minus two, but modern researchers are showing that this can vary depending on variables like the stored items' phonological properties. When several elements (such as digits, words, or pictures) are held in short-term memory simultaneously, their representations compete with each other for recall, or degrade each other. Thereby, new content gradually pushes out older content, unless the older content is actively protected against interference by rehearsal or by directing attention to it.

Information in the short-term memory is readily accessible, but for only a short time. It continuously decays, so in the absence of rehearsal (keeping information in short-term memory by mentally repeating it) it can be forgotten.

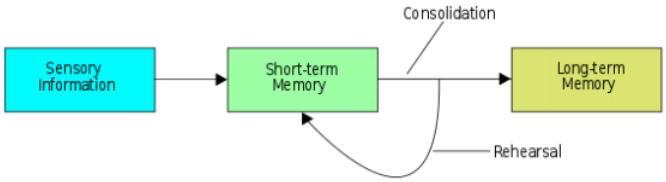

Figure 5.6.2: Diagram of the memory storage process. (Image by Wikipedia is licensed under CC BY-SA 3.0)

Long-Term Memory Storage

In contrast to short-term memory, **long-term memory** is the ability to hold semantic information for a prolonged period of time. Items stored in short-term memory move to long-term memory through rehearsal, processing, and use. The capacity of long-term memory storage is much greater than that of short-term memory, and perhaps unlimited. However, the duration of long-term memories is not permanent; unless a memory is occasionally recalled, it may fail to be recalled on later occasions. This is known as forgetting.

Long-term memory storage can be affected by traumatic brain injury or lesions. Amnesia, a deficit in memory, can be caused by brain damage. Anterograde amnesia is the inability to store new memories; retrograde amnesia is the inability to retrieve old memories. These types of amnesia indicate that memory does have a storage process.[25]

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5.S: Summary

In this chapter we looked at:

- Piaget's sensorimotor stage.
- The impact of the social environment on children's learning.
- The progression and theories of language development.
- Classical and operant conditioning and systems of reinforcement.
- The types of memory and how they work together.

In the following chapter, we will finish looking at the first two years of life by examining social and emotional development, including temperament and attachment.

6: SOCIAL AND EMOTIONAL DEVELOPMENT IN INFANCY AND TODDLERHOOD

Paris, Ricardo, Raymond, & Johnson
College of the Canyons

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CHAPTER OVERVIEW

6: Social and Emotional Development in Infancy and Toddlerhood

Learning Objectives

After this chapter, you should be able to:

1. Classify types of temperament.
2. Discuss the roles of culture and gender in socialization.
3. Describe the sequence of emotional development during the first two years.
4. Compare different theories of attachment and attachment styles.
5. Explain Erikson's stage of trust versus mistrust.
6. Contrast child care options for families.

While temperament is determined by genetics and emotions develop through maturation, the early interactions we have with the adults that care for us as infants and toddlers are very important for healthy emotional development. Let's examine some of the important interactions and milestones in social and emotional development during the first two years of life.

Thumbnail: www.pexels.com/photo/baby-touching-woman-s-face-1257110/

6.1: Temperament

Perhaps you have spent time with a number of infants. How were they alike? How did they differ? How do you compare 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 the innate characteristics of the infant, including mood, activity level, and emotional reactivity, noticeable soon after birth.

In a 1956 landmark study, Chess and Thomas (1996) evaluated 141 children's temperament based on parental interviews. Referred to as the New York Longitudinal Study, infants were assessed on 10 dimensions of temperament including:

- activity level
- rhythmicity (regularity of biological functions)
- approach/withdrawal (how children deal with new things)
- adaptability to situations
- intensity of reactions
- threshold of responsiveness (how intense a stimulus has to be for the child to react)
- quality of mood
- distractibility
- attention span
- persistence

Based on the infants' behavioral profiles, they were categorized into three general types of temperament:

Table 6.1.1: Types of Temperament

Type	Percentage	Description
Easy	**40%**	• Able to quickly adapt to routine and new situations • Remains calm • Easy to soothe • Usually in positive mood
Difficult	**10%**	• Reacts negatively to new situations • Has trouble adapting to routine • Usually negative in mood • Cries frequently
Slow-to-warm- up	**15%**	• Low activity level • Adjusts slowly to new situations • Often negative in mood

As can be seen the percentages do not equal 100% as some children were not able to be placed neatly into one of the categories. Think about how each type of child should be approached to improve interactions with them. An easy child requires less intervention, but still has needs that must not be overlooked. A slow-to-warm-up child may need to be given advance warning if new people or situations are going to be introduced. A child with a difficult temperament may need to be given extra time to burn off their energy.

A caregiver's ability to work well and accurately read the child will enjoy a **goodness-of-fit**, meaning their styles match and communication and interaction can flow. Parents who recognize each child's temperament and accept it, will nurture more effective interactions with the child and encourage more adaptive functioning.[1]

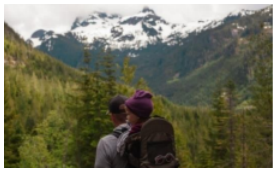

Figure 6.1.1: This adventurous child's parents provide a good "fit" to her temperament. (Image is licensed under CC0 1.0)

Parenting is Bidirectional

Not only do parents affect their children, children influence their parents. A child's characteristics, such as temperament, 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 influences how parents behave with their children.

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6.2: Personality

Temperament does not 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. In contrast, **personality**, defined as an individual's consistent pattern of feeling, thinking, and behaving, is the result of the continuous interplay between biological disposition and experience.

Personality also develops from temperament in other ways (Thompson, Winer, & Goodvin, 2010). As children mature biologically, temperamental characteristics emerge and change over time. A newborn is not capable of much self-control, but as brain-based capacities for self-control advance, temperamental changes in self-regulation become more apparent. For example, a newborn who cries frequently doesn't necessarily have a grumpy personality; over time, with sufficient parental support and increased sense of security, the child might be less likely to cry.

In addition, personality is made up of many other features besides temperament. Children's developing self-concept, their motivations to achieve or to socialize, their values and goals, their coping styles, their sense of responsibility and conscientiousness, as well as many other qualities are encompassed into personality. These qualities are influenced by biological dispositions, but even more by the child's experiences with others, particularly in close relationships, that guide the growth of individual characteristics. Indeed, personality development begins with the biological foundations of temperament but becomes increasingly elaborated, extended, and refined over time. The newborn that parents gazed upon thus becomes an adult with a personality of depth and nuance. 3

Culture and Personality

The term **culture** refers to all of the beliefs, customs, ideas, behaviors, and traditions of a particular society that are passed through generations. Culture is transmitted to people through language as well as through the modeling of behavior, and it defines which traits and behaviors are considered important, desirable, or undesirable.

Within a culture there are norms and behavioral expectations. These cultural norms can dictate which personality traits are considered important. The researcher Gordon Allport considered culture to be an important influence on traits and defined common traits as those that are recognized within a culture. These traits may vary from culture to culture based on differing values, needs, and beliefs. Positive and negative traits can be determined by cultural expectations: what is considered a positive trait in one culture may be considered negative in another, thus resulting in different expressions of personality across cultures.

Figure 6.2.1: A family from a non-Western culture. (Image by Theodor Goutas on Unsplash)

Considering cultural influences on personality is important because Western ideas and theories are not necessarily applicable to other cultures (Benet-Martinez & Oishi, 2008). There is a great deal of evidence that the strength of personality traits varies across cultures, and this is especially true when comparing individualist cultures (such as European, North American, and Australian cultures) and collectivist cultures (such as Asian, African, and South American cultures). People who live in **individualist cultures** tend to believe that independence, competition, and personal achievement are important. In contrast, people who live in **collectivist cultures** tend to value social harmony, respectfulness, and group needs over individual needs. These values influence personality in different but substantial ways; for example, Yang (2006) found that people in individualist cultures displayed more personally-oriented personality traits, whereas people in collectivist cultures displayed more socially-oriented personality traits. 5

Gender and Personality

In much the same manner that cultural norms can influence personality and behavior, gender norms (the behaviors that males and females are expected to conform to in a given society) can also influence personality by emphasizing different traits between different genders.

Figure 6.2.2: A female infant wearing stereotypically feminine clothing and accessories. (Image by Abdullah Shakoor on Pixabay)

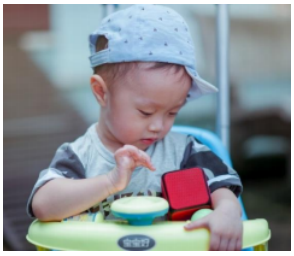

Figure 6.2.3: A male infant wearing stereotypically masculine clothing. (Image is licensed under CC0 1.0)

Ideas of appropriate behavior for each gender (masculine and feminine) vary among cultures and tend to change over time. For example, aggression and assertiveness have historically been emphasized as positive masculine personality traits in the United States. Meanwhile, submissiveness and caretaking have historically been held as ideal feminine traits. While many **gender roles** remain the same, others change over time. In 1938, for example, only 1 out of 5 Americans agreed that a married woman should earn money in industry and business. By 1996, however, 4 out of 5 Americans approved of women working in these fields. This type of attitude change has been accompanied by behavioral shifts that coincide with changes in trait expectations and shifts in personal identity for men and women. 8

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6.3: Infant Emotions

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 (Lavelli & Fogel, 2005).

Social smiling becomes more stable and organized as infants learn to use their smiles to engage their parents in interactions. Pleasure is expressed as laughter at 3 to 5 months of age, and displeasure becomes more specific as fear, sadness, or anger between ages 6 and 8 months.

Anger is often the reaction to being prevented from obtaining a goal, such as a toy being removed (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010). In contrast, sadness is typically the response when infants are deprived of a caregiver (Papousek, 2007). Fear is often associated with the presence of a stranger, known as **stranger wariness**, or the departure of significant others known as **separation anxiety**. Both appear sometime between 6 and 15 months after object permanence has been acquired. Further, there is some indication that infants may experience jealousy as young as 6 months of age (Hart & Carrington, 2002).

Figure 6.3.1: An infant making an angry facial expression. (Image by Brytny.com on Unsplash)

Emotions are often divided into two general categories: **Basic emotions** (primary emotions), such as interest, happiness, anger, fear, surprise, sadness and disgust, which appear first, and **self-conscious emotions** (secondary emotions), such as envy, pride, shame, guilt, doubt, and embarrassment. Unlike primary emotions, secondary emotions appear as children start to develop a self-concept, and require social instruction on when to feel such emotions. The situations in which children learn self-conscious emotions varies from culture to culture. Individualistic cultures teach us to feel pride in personal accomplishments, while in more collective cultures children are taught to not call attention to themselves, unless you wish to feel embarrassed for doing so (Akimoto & Sanbinmatsu, 1999).

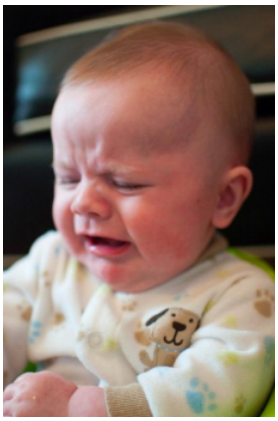

Figure 6.3.2: An infant making a sad facial expression (Image by acheron0 is licensed under CC BY 2.0)

Facial expressions of emotion are important regulators of social interaction. In the developmental literature, this concept has been investigated under the concept of **social referencing**; that is, the process whereby infants seek out information from others to clarify a situation and then use that information to act (Klinnert, Campos, & Sorce, 1983). To date, the strongest demonstration of

social referencing comes from work on the visual cliff. In the first study to investigate this concept, Campos and colleagues (Sorce, Emde, Campos, & Klinnert, 1985) placed mothers on the far end of the "cliff" from the infant. Mothers first smiled to the infants and placed a toy on top of the safety glass to attract them; infants invariably began crawling to their mothers. When the infants were in the center of the table, however, the mother then posed an expression of fear, sadness, anger, interest, or joy. The results were clearly different for the different faces; no infant crossed the table when the mother showed fear; only 6% did when the mother posed anger, 33% crossed when the mother posed sadness, and approximately 75% of the infants crossed when the mother posed joy or interest.

Other studies provide similar support for facial expressions as regulators of social interaction. Researchers posed facial expressions of neutral, anger, or disgust toward babies as they moved toward an object and measured the amount of inhibition the babies showed in touching the object (Bradshaw, 1986). The results for 10- and 15-month olds were the same: Anger produced the greatest inhibition, followed by disgust, with neutral the least. This study was later replicated using joy and disgust expressions, altering the method so that the infants were not allowed to touch the toy (compared with a distractor object) until one hour after exposure to the expression (Hertenstein & Campos, 2004). At 14 months of age, significantly more infants touched the toy when they saw joyful expressions, but fewer touched the toy when the infants saw disgust.

A final emotional change is in self-regulation. **Emotional self-regulation** refers to strategies we use to control our emotional states so that we can attain goals (Thompson & Goodvin, 2007). This requires effortful control of emotions and initially requires assistance from caregivers (Rothbart, Posner, & Kieras, 2006). Young infants have very limited capacity to adjust their emotional states and depend on their caregivers to help soothe themselves. Caregivers can offer distractions to redirect the infant's attention and comfort to reduce the emotional distress. As areas of the infant's prefrontal cortex continue to develop, infants can tolerate more stimulation. By 4 to 6 months, babies can begin to shift their attention away from upsetting stimuli (Rothbart et al, 2006). Older infants and toddlers can more effectively communicate their need for help and can crawl or walk toward or away from various situations (Cole, Armstrong, & Pemberton, 2010). This aids in their ability to self-regulate. Temperament also plays a role in children's ability to control their emotional states, and individual differences have been noted in the emotional self-regulation of infants and toddlers (Rothbart & Bates, 2006). 11

Figure 6.3.3: A toddler at a park. (Image is licensed under CC0)

Development of sense of self: During the second year of life, children begin to recognize themselves as they gain a sense of self as separate from their primary caregiver. In a classic experiment by Lewis and Brooks (1978) children 9 to 24 months of age were placed in front of a mirror after a spot of rouge was placed on their nose as their mothers pretended to wipe something off the child's face. If the child reacted by touching his or her own nose rather than that of the "baby" in the mirror, it was taken to suggest that the child recognized the reflection as him or herself. Lewis and Brooks found that somewhere between 15 and 24 months most infants developed a sense of self-awareness. **Self-awareness** is the realization that you are separate from others (Kopp, 2011). Once a child has achieved self-awareness, the child is moving toward understanding social emotions such as guilt, shame or embarrassment, as well as, sympathy or empathy. 13

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6.4: Social Emotional Milestones

As infants and toddlers interact with other people, their social and emotional skills develop. Here is a table of social and emotional milestones that they typically experience during the first two years.

Table 6.4.1: Social and Emotional Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do By This Age
2 months	• Begins to smile at people • Can briefly calm self (may bring hands to mouth and suck on hand) • Tries to look at parent
4 months	• Smiles spontaneously, especially at people • Likes to play with people and might cry when playing stops • Copies some movements and facial expressions, like smiling or frowning
6 months	• Knows familiar faces and begins to know if someone is a stranger • Likes to play with others, especially parents • Responds to other people's emotions and often seems happy • Likes to look at self in a mirror
9 months	• May be afraid of strangers • May be clingy with familiar adults • Has favorite toys
1 year	• Is shy or nervous with strangers • Cries when mom or dad leaves • Has favorite things and people • Shows fear in some situations • Hands you a book when wants to hear a story • Repeats sounds or actions to get attention • Puts out arm or leg to help with dressing • Plays games such as "peek-a-boo" and "pat-a-cake"
18 months	• Likes to hand things to others as play • May have temper tantrums • May be afraid of strangers • Shows affection to familiar people • Plays simple pretend, such as feeding a doll • May cling to caregivers in new situations • Points to show others something interesting • Explores alone but with parent close by
2 years	• Copies others, especially adults and older children • Gets excited when with other children • Shows more and more independence • Shows defiant behavior (doing what he has been told not to) • Plays mainly beside other children, but is beginning to include other children, such as in chase games

6.5: Forming Attachments

Attachment is the close bond with a caregiver from which the infant derives a sense of security. The formation of attachments in infancy has been the subject of considerable research as attachments have been viewed as foundations for future relationships. Additionally, attachments form the basis for confidence and curiosity as toddlers, and as important influences on self- concept.

Figure 6.5.1: The formation of attachment in action as a father snuggles a newborn. (Image by Andres and Antoinette Ricardo used with permission)

Freud's Psychoanalytic Theory

According to Freud (1938) infants are oral creatures who obtain pleasure from sucking and mouthing objects. Freud believed the infant will become attached to a person or object that provides this pleasure. Consequently, infants were believed to become attached to their mother because she was the one who satisfied their oral needs and provided pleasure. Freud further believed that the infants will become attached to their mothers "if the mother is relaxed and generous in her feeding practices, thereby allowing the child a lot of oral pleasure," (Shaffer, 1985, p. 435).

Harlow's Research

In one classic study, Wisconsin University psychologists Harry and Margaret Harlow investigated the responses of young rhesus monkeys to explore if breastfeeding was the most important factor to attachment.

Figure 6.5.2: A rhesus monkey sucking its thumb. (Image by splotter_nl is licensed under CC BY 2.0)

The infant monkeys were separated from their biological mothers, and two surrogate mothers were introduced to their cages. The first mother (the wire mother) consisted of a round wooden head, a mesh of cold metal wires, and a bottle of milk from which the baby monkey could drink. The second mother was a foam-rubber form wrapped in a heated terry-cloth blanket. The infant monkeys went to the wire mother for food, but they overwhelmingly preferred and spent significantly more time with the warm terry-cloth mother. The warm terry-cloth mother provided no food but did provide comfort (Harlow, 1958). The infant's need for physical closeness and touching is referred to as **contact comfort**. Contact comfort is believed to be the foundation for attachment. The Harlows' studies confirmed that babies have social as well as physical needs. Both monkeys and human babies need a secure base that allows them to feel safe. From this base, they can gain the confidence they need to venture out and explore their worlds.

Bowlby's Theory

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). 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 (Bowlby, 1982). A **secure base** is a parental presence that gives the child a sense of safety as the child explores the surroundings.

Figure 6.5.3: A mother offering a secure base as her infant plays on a slide. (Image is licensed under CC0)

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). Additionally, Bowlby observed that infants would go to extraordinary lengths to prevent separation from their parents, such as crying, refusing to be comforted, and waiting for the caregiver to return.

Figure 6.5.4: This child is seeking comfort from an attachment figure. (Image on Pexels)

Bowlby also observed that these same expressions were common to many other mammals, and consequently argued that these negative responses to separation serve an evolutionary function. Because mammalian infants cannot feed or protect themselves, they are dependent upon the care and protection of adults for survival. Thus, those infants who were able to maintain proximity to an attachment figure were more likely to survive and reproduce.

Erikson: Trust vs. Mistrust

As previously discussed in chapter 1, Erikson formulated an eight-stage theory of psychosocial development. Erikson was in agreement on the importance of a secure base, arguing that the most important goal of infancy was the development of a basic sense of trust in one's caregivers. Consequently, the first stage, trust vs. mistrust, highlights the importance of attachment. Erikson maintained that the first year to year and a half of life involves the establishment of a sense of trust (Erikson, 1982). 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 trustworthy place. The caregiver should not worry about overly indulging a child's need for comfort, contact or stimulation.

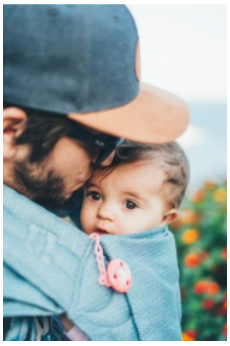

Figure 6.5.5: This baby-wearing father is creating trust with his infant child. (Image by Ferenc Horvath on Unsplash)

Problems Establishing Trust

Erikson (1982) believed that mistrust could contaminate all aspects of one's life and deprive the individual of love and fellowship with others. 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 make him or her more challenging to parent. Under these circumstances, we cannot assume that the parent is going to provide the child with a feeling of trust.

Mary Ainsworth and the Strange Situation

Developmental psychologist Mary Ainsworth, a student of John Bowlby, continued studying the development of attachment in infants. Ainsworth and her colleagues created a laboratory test that measured an infant's attachment to his or her parent. The test is called **The Strange Situation** because it is conducted in a context that is unfamiliar to the child and therefore likely to heighten the child's need for his or her parent (Ainsworth, 1979).

Figure 6.5.6: An infant crawling on the floor with toys around as done in the Strange Situation. (Image is in the public domain)

During the procedure, which lasts about 20 minutes, the parent and the infant are first left alone, while the infant explores the room full of toys. Then a strange adult enters the room and talks for a minute to the parent, after which the parent leaves the room. The stranger stays with the infant for a few minutes, and then the parent again enters and the stranger leaves the room. During the entire session, a video camera records the child's behaviors, which are later coded by the research team. The investigators were especially interested in how the child responded to the caregiver leaving and returning to the room, referred to as the "reunion." On the basis of their behaviors, the children are categorized into one of four groups where each group reflects a different kind of attachment relationship with the caregiver. One style is secure and the other three styles are referred to as insecure.

- A child with a **secure attachment style** usually explores freely while the caregiver is present and may engage with the stranger. The child will typically play with the toys and bring one to the caregiver to show and describe from time to time. The child may be upset when the caregiver departs, but is also happy to see the caregiver return.
- A child with an **ambivalent** (sometimes called resistant) **attachment style** is wary about the situation in general, particularly the stranger, and stays close or even clings to the caregiver rather than exploring the toys. When the caregiver leaves, the child is extremely distressed and is ambivalent when the caregiver returns. The child may rush to the caregiver, but then fails to be comforted when picked up. The child may still be angry and even resist attempts to be soothed.
- A child with an **avoidant attachment style** will avoid or ignore the mother, showing little emotion when the mother departs or returns. The child may run away from the mother when she approaches. The child will not explore very much, regardless of who is there, and the stranger will not be treated much differently from the mother.
- A child with a **disorganized/disoriented attachment style** seems to have an inconsistent way of coping with the stress of the strange situation. The child may cry during the separation, but avoid the mother when she returns, or the child may approach the mother but then freeze or fall to the floor.

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 ambivalent. Another 5 to 10 percent may be characterized as disorganized.

Some cultural differences in attachment styles have been found (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2010). 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, U. S. values and interpretation. Newer methods for assessment 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 (Waters, 1987). There are 90 items in the third version of the Q-sort technique, and examples of the behaviors assessed include:

- When child returns to mother after playing, the child is sometimes fussy for no clear reason.
- When the child is upset or injured, the child will accept comforting from adults other than mother.
- Child often hugs or cuddles against mother, without her asking or inviting the child to do so.
- When the child is upset by mother's leaving, the child continues to cry or even gets angry after she is gone.

At least two researchers observe the child and parent in the home for 1.5-2 hours per visit. Usually two visits are sufficient to gather adequate information. The parent is asked if the behaviors observed are typical for the child. This information is used to test the validity of the Strange Situation classifications across age, cultures, and with clinical populations.

Caregiver Consistency

Having a consistent caregiver may be jeopardized if the infant is cared for in a child care setting with a high turnover of staff or if institutionalized and given little more than basic physical care.

Infants who, perhaps because of being in orphanages with inadequate care, have not had the opportunity to attach in infancy may still form initial secure attachments several years later. However, they may have more emotional problems of depression, anger, or be overly friendly as they interact with others (O'Connor et. al., 2003).

Social Deprivation

Severe deprivation of parental attachment can lead to serious problems. According to studies of children who have not been given warm, nurturing care, they may show developmental delays, failure to thrive, and attachment disorders (Bowlby, 1982). **Non-organic failure to thrive** is the diagnosis for an infant who does not grow, develop, or gain weight on schedule. In addition, postpartum depression can cause even a well-intentioned mother to neglect her infant.

Figure 6.5.7: This is a residential nursery in 1888. (Image is in the public domain)

Reactive Attachment Disorder

Children who experience social neglect or deprivation, repeatedly change primary caregivers that limit opportunities to form stable attachments, or are reared in unusual settings (such as institutions) that limit opportunities to form stable attachments can certainly have difficulty forming attachments. According to the Diagnostic and Manual of Mental Disorders, 5th edition (American Psychiatric Association, 2013), those children experiencing neglectful situations and also displaying markedly disturbed and developmentally inappropriate attachment behavior, such as being inhibited and withdrawn, minimal social and emotional responsiveness to others, and limited positive affect, may be diagnosed with **Reactive Attachment Disorder**. This disorder often occurs with developmental delays, especially in cognitive and language areas. Fortunately, the majority of severely neglected children do not develop Reactive Attachment Disorder, which occurs in less than 10% of such children. The quality of the caregiving environment after serious neglect affects the development of this disorder.

Resiliency

Being able to overcome challenges and successfully adapt is **resiliency**. Even young children can exhibit strong resilience to harsh circumstances. Resiliency can be attributed to certain personality factors, such as an easy-going temperament. Some children are warm, friendly, and responsive, whereas others tend to be more irritable, less manageable, and difficult to console, and these differences play a role in attachment (Gillath, Shaver, Baek, & Chun, 2008; Seifer, Schiller, Sameroff, Resnick, & Riordan, 1996). It seems safe to say that attachment, like most other developmental processes, is affected by an inter play of genetic and socialization influences.

Receiving support from others also leads to resiliency. 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. In a direct test of this idea, Dutch researcher van den Boom (1994) randomly assigned some babies' mothers to a training session in which they learned to better respond to their children's needs. The research found that these mothers' babies were more likely to show a secure attachment style in comparison to the mothers in a control group that did not receive training. 22

Figure 6.5.8: This infant massage class for new mothers could provide training and support for mothers. (Image is in the public domain)

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6.6: Child Care

According to the U.S. Census Bureau in 2011, over sixty percent of families with children under five relied on regular child care arrangements. Around a quarter of those families used organized child care facilities as their primary arrangement.24

Child care involves supervising a child or children, usually from infancy to age thirteen, and typically refers to work done by somebody outside the child's immediate family. Child care is a broad topic covering a wide spectrum of contexts, activities, social and cultural conventions, and institutions. The majority of child care institutions that are available require that child care providers have extensive training in first aid and are CPR certified. In addition, background checks, drug testing, and reference verification are normally required.

It is traditional in Western society for children to be cared for by their parents or their legal guardians. In families where children live with one or both of their parents, the child care role may also be taken on by the child's extended family. If a parent or extended family is unable to care for the children, orphanages and foster homes are a way of providing for children's care, housing, and schooling.

Child Care in the United States

Formal child care options include **center-based care** and **family child care homes**. Each state has different regulations for licensing child care centers, including teacher requirements. In some states, teaching in a child care center requires an associate's degree in child development. States with quality standards built into their licensing programs may have higher requirements for support staff, such as teacher assistants. **Head Start** (a federally funded child care program for income qualified families) lead teachers must have a bachelor's degree in Early Childhood Education. States vary in other standards set for daycare providers, such as teacher to child ratios.

Figure 6.15 – A caretaker reading to an infant. (Image by the Air Force Medical Service is in the public domain)

State legislation may regulate the number and ages of children allowed before the home is considered an official family child care program and subject to licensing regulations. Often the nationally recognized Child Development Associate credential is the minimum standard for the individual leading this home care program.

Figure 6.16 – A caretaker playing with a group of children. (Image by the U.S. Air Force is in the public domain)

In addition to these licensed options, parents may also choose to find their own caregiver or arrange childcare exchanges/swaps with another family. This care is typically provided by nannies, au pairs, or friends and family. The child is watched inside their own home or the caregiver's home, reducing exposure to outside children and illnesses. Depending on the number of children in the home, the children utilizing in-home care can enjoy the greatest amount of interaction with their caregiver and form a close bond.

There are no required licensing or background checks for this type of in-home care, making parental vigilance essential in choosing an appropriate caregiver. The cost of in-home care is the highest of childcare options per child, though a household with many children may find this the most convenient and affordable option. 27

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6.S: Summary

In this chapter, we looked at:

- Temperament and goodness-of-fit.
- Cultural and gender influences.
- The development of emotions.
- Theories and styles of attachment.
- Erikson’s stage of trust versus distrust.
- Importance of attachment and things that can impede it.
- The types of child care available to families.

Language & Cognition

Motor Development

Motor development occurs in an orderly sequence as infants move from reflexive reactions (e.g., sucking and rooting) to more advanced motor functioning. As mentioned during the prenatal section, development occurs according to the **Cephalocaudal** (*from head to tail*) and **Proximodistal** (*from the midline outward*) principles. For instance, babies first learn to hold their heads up, then to sit with assistance, then to sit unassisted, followed later by crawling, pulling up, **cruising** or *walking while holding on to something*, and then unassisted walking (Eisenberg, Murkoff, & Hathaway, 1989). 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. On average, most babies sit alone at 7 months. Sitting involves both coordination and muscle strength, and 90% of babies achieve this milestone between 5 and 9 months old. If the child is displaying delays on several milestones, that is reason for concern, and the parent or caregiver should check in with the child's pediatrician. Developmental delays can be identified and addressed through early intervention.

Figure 3.19. Infant displaying the palmer grasp.

Motor Skills *refer to our ability to move our bodies and manipulate objects*. **Gross motor skills** *focus on large muscle groups that control our head, torso, arms and legs and involve larger movements* (e.g., balancing, running, and jumping). These skills begin to develop first. Examples include moving to bring the chin up when lying on the stomach, moving the chest up, and 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). 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 *focus on the muscles in our 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. At this age *grasping an object involves the use of the fingers and palm, but no thumbs. This is known as the* **Palmer Grasp**. *The 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. Now the infant uses a* **Pincer Grasp**, and this ability greatly enhances the ability to control and manipulate an object. 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.

Sensory Capacities

Throughout much of history, the newborn was considered a passive, disorganized being who possessed minimal

abilities. William James, an early psychologist, had described the newborn's world as "a blooming, buzzing confusion" (Shaffer, 1985). However, current research techniques have demonstrated just how developed the newborn is with especially organized sensory and perceptual abilities.

Vision. The womb is a dark environment void of visual stimulation. Consequently, vision is one of the most poorly developed senses at birth, and time is needed to build neural pathways between the eyes and the brain (American Optometric Association [AOA], 2019). Newborns typically cannot see further than 8 to 10 inches away from their faces (AOA, 2019). An 8-week old's vision is 20/300. This means an object 20 feet away from an infant has the same clarity as an object 300 feet away from an adult with normal vision. By 3-months visual acuity has sharpened to 20/200, which would allow them the see the letter E at the top of a standard eye chart (Hamer, 2016). As a result, the world initially looks blurry to young infants (Johnson & deHaan, 2015).

Why is visual acuity so poor in the infant? The **fovea**, *which is the central field of vision in the retina and allows us to see sharp detail*, is not fully developed at birth, and does not start to reach adult levels of development until 15 months (Li & Ding, 2017). Even by 45 months some of the sensory neurons (cones) of the fovea are still not fully grown. Can babies see color? Young infants can perceive color, but the colors need to be very pure forms of basic colors, such as vivid red or green rather than weaker pastel shades. Most studies report that babies can see the full spectrum of colors by five months of age (AOA, 2019).

Newborn infants prefer and orient to face-like stimuli more than they do other patterned stimuli (Farroni et al., 2005). They also prefer images of faces that are upright and not scrambled (Chien, 2011). Infants also quickly learn to distinguish the face of their mother from faces of other women (Bartrip, Morton, & De Schonen, 2001). When viewing a person's face, one-month olds fixate on the outer edges of the face rather than the eyes, nose, or mouth, but two-month olds gaze more at the inner features, especially the eyes (Hainline, 1978). Researchers have examined the development of attention and tracking in the visual system and have found the following for young infants:

- One-month-olds have difficulty disengaging their attention and can spend several minutes fixedly gazing at a stimulus (Johnson & deHaan, 2015).
- Aslin (1981) found that when tracking an object visually, the eye movements of newborns and one-month olds are not smooth but **saccadic,** that is *step-like jerky movements*. Aslin also found that eye movements lag behind an object's motion. This means young infants do not anticipate the trajectory of the object. By two months of age, their eye movements are becoming smoother, but they still lag behind the motion of the object and will not achieve this until about three to four months of age (Johnson & deHaan, 2015).
- Newborns also orient more to the visual field toward the side of the head, than to the visual field on either side of the nose (Lewis, Maurer, & Milewski, 1979). By two to three months, stimuli in both fields are now attended to equally (Johnson & deHaan, 2015).

Binocular vision, *which requires input from both eyes*, is evident around the third month and continues to develop during the first six months (Atkinson & Braddick, 2003). By six months infants 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).

Hearing. The infant's sense of hearing is very keen at birth, and the ability to hear is evidenced as soon as the seventh month of prenatal development. Newborns prefer their mother's voices over another female even if speaking the same material (DeCasper & Fifer, 1980). Additionally, they will register in utero specific information heard from their mother's voice. DeCasper and Spence (1986) tested 16 infants (average age of 55.8 hours) whose mothers had previously read to them prenatally. The mothers read several passages to their fetuses, including the first 28 paragraphs of the *Cat in the Hat*, beginning when they were 7 months pregnant. The fetuses had been exposed to the stories an average of 67 times or 3.5 hours. When the experimental infants were tested, the target stories (previously heard) were more reinforcing than the novel story as measured by their rate of sucking. However, for control infants, the target stories were not more reinforcing than the novel story indicating that the experimental infants had heard them before.

Figure 3.20

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. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech, which will be discussed later. Additionally, infants are innately ready to respond to the sounds of any language, but between six and nine months they show preference for listening to their native language (Jusczyk, Cutler, & Redanz, 1993). Their ability to distinguish the sounds that are not in the language around them diminishes rapidly (Cheour-Luhtanen, et al., 1995).

Touch and pain. Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013). Newborns who are **circumcised,** *which is 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). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, today many local pain killers are currently used during circumcision.

Figure 3.21

Taste and smell. Studies of taste and smell demonstrate that babies respond with different facial expressions, suggesting that certain preferences are innate. Newborns can distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. Newborns also prefer the smell of their mothers. An infant only 6 days old is significantly more likely to turn toward its own mother's breast pad than to the breast pad of another baby's mother (Porter, Makin, Davis, & Christensen, 1992), and within hours of birth an infant also shows a preference for the face of its own mother (Bushnell, 2001; Bushnell, Sai, & Mullin, 1989).

Intermodality. Infants seem to be born with the ability to perceive the world in an **intermodal** way; that is, *through stimulation from more than one sensory modality*. For example, infants who sucked on a pacifier with either a smooth or textured surface preferred to look at a corresponding (smooth or textured) visual model of the pacifier. By 4 months,

infants can match lip movements with speech sounds and can match other audiovisual events. Sensory processes are certainly affected by the infant's developing motor abilities (Hyvärinen, Walthes, Jacob, Nottingham Chapin, & Leonhardt, 2014). Reaching, crawling, and other actions allow the infant to see, touch, and organize his or her experiences in new ways.

How are infants tested. Habituation procedures, *that is measuring decreased responsiveness to a stimulus after repeated presentations*, have increasingly been used to evaluate infants in studies of the development of perceptual and memory skills. Phelps (2005) describes a habituation procedure used when measuring the rate of the sucking reflex. Researchers first measure the initial baseline rate of sucking to a pacifier equipped with transducers that measure muscle contractions. Next, an auditory stimulus is presented, such as a human voice uttering a speech sound such as "da." The rate of sucking will typically increase with the new sound, but then decrease to baseline levels as "da" is repeatedly presented, showing habituation. If the sound "ma" was then presented, the rate of sucking would again increase, demonstrating that the infant can discriminate between these two stimuli.

Additionally, the speed or efficiency with which infants show habituation has been shown to predict outcomes in behaviors, such as language acquisition and verbal and nonverbal intelligence. Infants who show difficulty during habituation, or habituate at slower than normal rates, have been found to be at an increased risk for significant developmental delays. Infants with Down syndrome, teratogen-exposed infants, malnourished infants, and premature infants have all been studied. Researchers have found that at the age of 16 months, high-risk infants show rates of habituation comparable to newborn infants (Phelps, 2005).

Learning Objectives: Cognitive Development in Infancy and Toddlerhood

- Explain the Piagetian concepts of schema, assimilation, and accommodation.
- List and describe the six substages of sensorimotor intelligence.
- Describe the characteristics of infant memory.
- Describe components and developmental progression of language.
- Identify and compare the theories of language.

Piaget and the Sensorimotor Stage

Piaget believed that children, even infants, actively try to make sense of their environments. He viewed **intelligence**, not as knowledge or facts we acquire, but as the *processes through which we adapt to our environment*. He argued that differences between children and adults are not based on the fact that children know less than adults, but because *they think in different ways the adults do*. Piaget used the ***clinical method*** in which he *closely observed individual children in great detail over long periods of time in their natural environment*. From these observations he developed his theory of cognitive development, which posits four qualitatively different stages (Piaget, 1954).

Schema, assimilation and accommodation. In addition to descriptions of different stages, Piaget was also very interested in the processes by which people come to understand the world (and in the process, to understand

themselves). He was focused on universal physical properties of environments, like time, space, and causality, which he called logic-mathematical thought. He argued that people make sense of the world by interacting with it. He assumed that all people, even infants, are active, curious, energetic, and intrinsically motivated, and it is through their active attempts to "make things happen" that they learn about natural laws. Piaget held that, as they go, infants and children ***construct models*** of how the world works, which are partial, incomplete, and not totally correct. He called these models, ***schema***, which an be thought of as *frameworks for organizing information.* As we continue interacting with the world, we keep trying out our mental models, and eventually encounter experiences that contradict them. These contradictions allow us to revise our models so that they can better account for the interactions we are experiencing. As models are revised, they are more adaptive– meaning that they guide our actions more effectively as we try to reach our goals.

Children develop their models, that is, their schemata, through processes of assimilation and accommodation. When faced with something new, a child may demonstrate **assimilation,** *which is fitting the new information into an existing schema*, such as calling all animals with four legs "doggies" because he or she has the concept of doggie. When it becomes clear that the new information no longer fits into the old schema, instead of assimilating the information, the child may demonstrate **accommodation**, *which is expanding the framework of knowledge to accommodate the new situation* and thus learning a new concept to more accurately name the animal. For example, recognizing that a horse is different than a zebra means the child has accommodated, and now the child has both a zebra schema and a horse schema. Even as adults we continue to try and "make sense" of new situations by determining whether they fit into our old way of thinking (assimilation) or whether we need to modify our thoughts (accommodation).

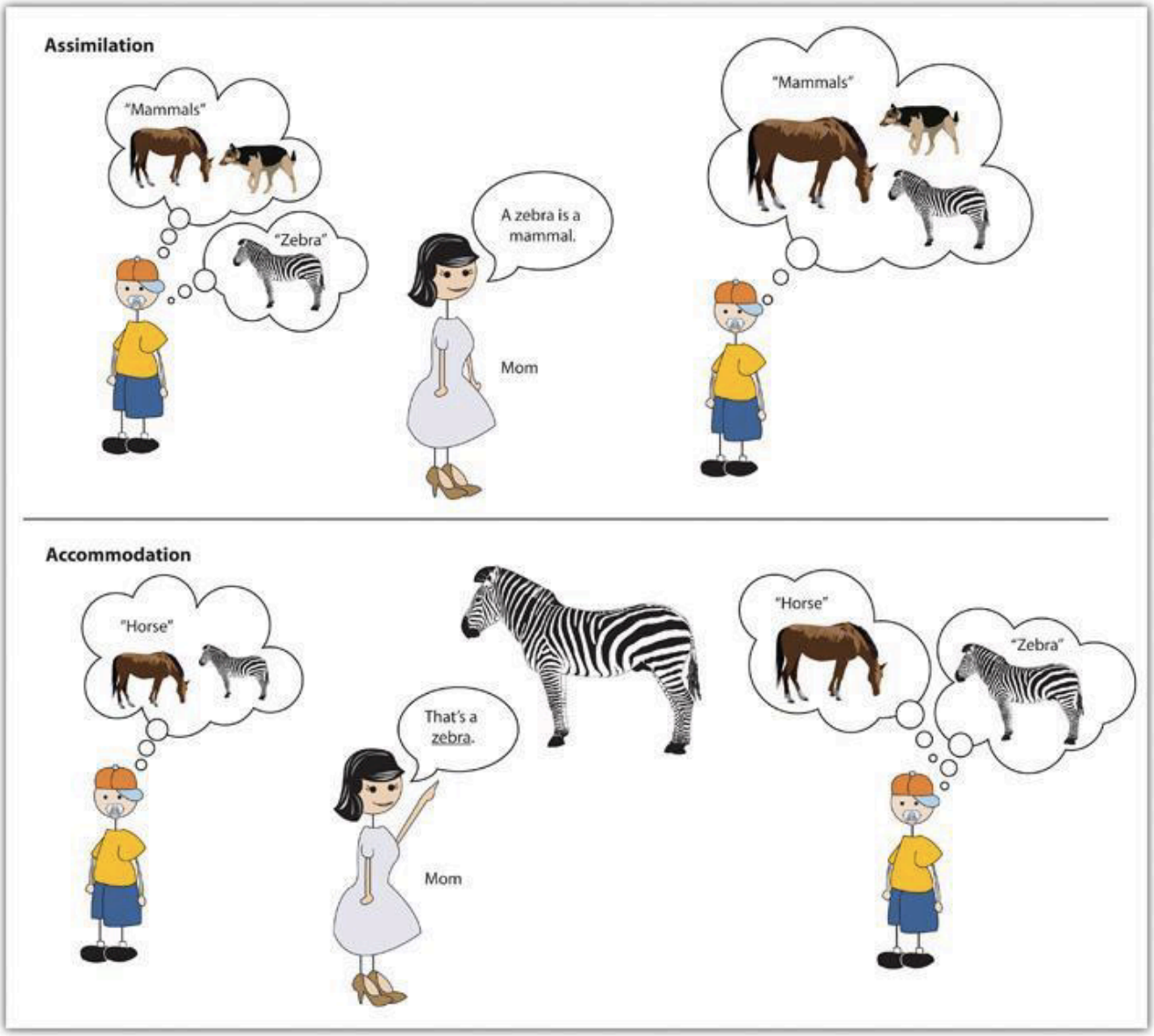

Figure 3.22

Piaget also described a process of **organization**, in which we *combine existing schemes into new and more complex ones*. By grouping and re-arranging schemas, and connecting them together, we can grow and refine our knowledge structures. Finally, he pointed to the process of **disequilibration**, where we detect discrepancies or contradictions between the models we are constructing and the experiences we are having in our interactions with the world. These contradictions can produce confusion or frustration, but they are developmentally helpful, because they lead to attempts to *readjust actions and models so they are in better alignment*, though a process called **equilibration**. Disequilibration and equilibration can also be applied to models themselves, as we detect that sub-parts of models contradict each other or are not in alignment. Though processes of equilibration we can re-organize models so that they are more internally consistent and coherent.

Cognitive development during infancy. Piaget's theories revolutionized the way that developmentalists thought about infants. He was one of the first researchers to argue that infants are intelligent and they are busily constructing

their own understandings of the world through their interactions with the environment. According to the Piagetian perspective, infants learn about the world primarily through their senses and motor abilities (Harris, 2005). These basic motor and sensory abilities provide the foundation for the cognitive skills that will emerge during the subsequent stages of cognitive development. *The first stage of cognitive development is referred to as the* **sensorimotor stage** and it occurs through six substages. Table 3.5 identifies the ages typically associated with each substage.

Table 3.5 Infant Ages for the Six Substages of the Sensorimotor Stage

Substage 1	Reflexes (0–1 month)
Substage 2	Primary Circular Reactions (1–4 months)
Substage 3	Secondary Circular Reactions (4–8 months)
Substage 4	Coordination of Secondary Circular Reactions (8–12 months)
Substage 5	Tertiary Circular Reactions (12–18 months)
Substage 6	Beginning of Representational Thought (18–24 months)

adapted from Lally & Valentine-French, 2019

Substage 1: Reflexes. Newborns learn about their world through the use of their reflexes, such as when sucking, reaching, and grasping. Eventually the use of these reflexes becomes more deliberate and purposeful.

Substage 2: Primary Circular Reactions. During these next 3 months, the infant begins to actively involve his or her own body in some form of repeated activity. An infant may accidentally engage in a behavior and find it interesting such as making a vocalization. This interest motivates the infant to try to do it again and helps the infant learn a new behavior that originally occurred by chance. The behavior is identified as circular because of the repetition, and as primary because it centers on the infant's own body.

Substage 3: Secondary Circular Reactions. The infant begins to interact with objects in the environment. At first the infant interacts with objects (e.g., a crib mobile) accidentally, but then these contacts with the objects are deliberate and become a repeated activity. The infant becomes more and more actively engaged in the outside world and takes delight in being able to make things happen. Repeated motion brings particular interest as, for example, the infant is able to bang two lids together from the cupboard when seated on the kitchen floor.

Figure 3.23

Substage 4: Coordination of Secondary Circular Reactions. The infant combines these basic reflexes and simple behaviors and uses planning and coordination to achieve a specific goal. Now the infant can engage in behaviors that others perform and anticipate upcoming events. Perhaps because of continued maturation of the prefrontal cortex, the infant become capable of having a thought and carrying out a planned, goal-directed activity. For example, an infant sees a toy car under the kitchen table and then crawls, reaches, and grabs the toy. The infant is coordinating both internal and external activities to achieve a planned goal.

Substage 5: Tertiary Circular Reactions. The toddler is considered a "little scientist" and begins exploring the world in a trial-and-error manner, using both motor skills and planning abilities. For example, the child might throw her ball down the stairs to see what happens. The toddler's active engagement in experimentation helps them learn about their world.

Figure 3.24

Substage 6: Beginning of Representational Thought. The sensorimotor period ends with the appearance of symbolic or representational thought. The toddler now has a basic understanding that objects can be used as symbols. Additionally, the child is able to solve problems using mental strategies, to remember something heard days before and repeat it, and to engage in pretend play. This initial movement from a "hands-on" approach to knowing about the world to the more mental world of substage six marks the transition to preoperational thought.

Development of object permanence. A critical milestone during the sensorimotor period is the development of object permanence. **Object permanence** *is the understanding that even if something is out of sight, it still exists* (Bogartz, Shinskey, & Schilling, 2000). According to Piaget, young infants cannot represent objects mentally, so they do not remember it after it has been removed from sight. Piaget studied infants' reactions when a toy was first shown to them and then hidden under a blanket. Infants who had already developed object permanence would reach for the hidden toy, indicating that they knew it still existed, whereas infants who had not developed object permanence would appear confused. Piaget emphasizes this construct because it is an objective way for children to demonstrate how they mentally represent their world. Children have typically acquired this milestone by 8 months. Once toddlers have mastered object permanence, they enjoy games like hide and seek, and they realize that when someone leaves the room they are still in the world. Toddlers also point to pictures in books and look in appropriate places when you ask them to find objects.

In Piaget's view, around the same time children develop object permanence, they also begin to exhibit **stranger anxiety**, *which is a fear of unfamiliar people* (Crain, 2005). Babies may demonstrate this by crying and turning away from a stranger, by clinging to a caregiver, or by attempting to reach their arms toward familiar faces, such as parents. Stranger anxiety results when a child is unable to assimilate the stranger into an existing schema; therefore, she cannot predict what her experience with that stranger will be like, which results in a fear response.

Critique of Piaget. Piaget thought that children's ability to understand objects, such as learning that a rattle makes a noise when shaken, was a cognitive skill that develops slowly as a child matures and interacts with the environment. Today, developmental psychologists **question the timetables** Piaget laid out. Researchers have found that even very young children understand objects and how they work long before they have experience with those objects (Baillargeon, 1987; Baillargeon, Li, Gertner, & Wu, 2011). For example, Piaget believed that infants did not fully master object permanence until substage 5 of the sensorimotor period (Thomas, 1979). However, infants seem to be able to recognize that objects have permanence at much younger ages. Diamond (1985) found that infants show earlier knowledge if the waiting period is shorter. At age 6 months, they retrieved the hidden object if their wait for retrieving the object is no longer than 2 seconds, and at 7 months if the wait is no longer than 4 seconds.

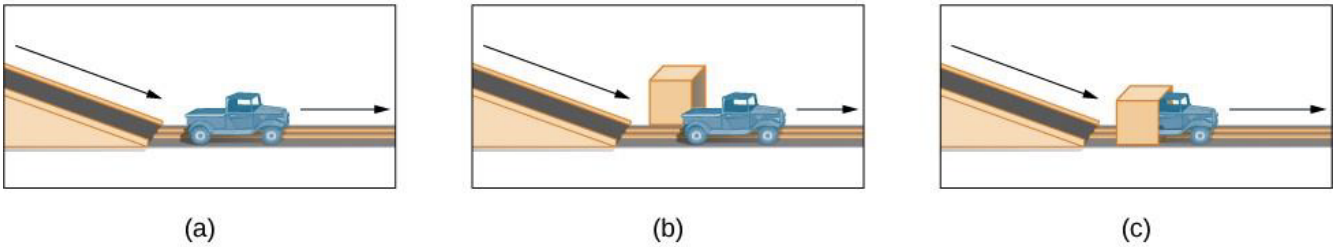

Figure. 3.25. In Baillargeon's (1987) study, infants observed a truck (a) roll down an unobstructed track, (b) roll down an unobstructed track with an obstruction (box) beside it, and (c) roll down and pass through what appeared to be an obstruction.

Development of Memory during Infancy

Memory requires the capacity to mentally represent experience, so it should not be surprising that infant memory is rather fleeting and fragile. As a result, older children and adults experience **infantile amnesia**, *the inability to recall memories from the first few years of life*. Several hypotheses have been proposed for this amnesia. From the biological perspective, it has been suggested that infantile amnesia is due to the immaturity of the infant brain, especially those areas that are crucial to the formation of autobiographical memory, such as the hippocampus. From the cognitive perspective, it has been suggested 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 largely photographic or visual memories. Finally, social theorists argue that episodic memories of personal experiences may hinge on an understanding of "self", something that is clearly lacking in infants and young toddlers.

However, in a series of clever studies Carolyn Rovee-Collier and her colleagues have demonstrated that infants can remember events from their life, even if these memories are short-lived. Three-month-old infants were taught that they could make a mobile hung over their crib shake by kicking their legs. The infants were placed in their crib, on their backs. A ribbon was tied to one foot and the other end to a mobile. At first infants made random movements, but then came to realize that by kicking they could make the mobile shake. After two 9-minute sessions with the mobile, the mobile was removed. One week later the mobile was reintroduced to one group of infants and most of the babies immediately started kicking their legs, indicating that they remembered their prior experience with the mobile. A second group of infants was shown the mobile two weeks later, and the babies made only random movements. The memory had faded (Rovee-Collier, 1987; Giles & Rovee-Collier, 2011). Rovee-Collier and Hayne (1987) found that 3-month-olds could remember the mobile after two weeks if they were shown the mobile and watched it move, even though they were not tied to it. This reminder helped most infants to remember the connection between their kicking and the movement of the mobile. Like many researchers of infant memory, Rovee-Collier (1990) found infant memory to be very context dependent. In other words, the sessions with the mobile and the later retrieval sessions had to be conducted under very similar circumstances or else the babies would not remember their prior experiences with the mobile. For instance, if the first mobile had had yellow blocks with blue letters, but at the later retrieval session the blocks were blue with yellow letters, the babies would not kick.

Infants older than 6 months of age can retain information for longer periods of time; they also need less reminding to retrieve information in memory. Studies of **deferred imitation**, that is, *the imitation of actions after a time delay*, can occur as early as six-months of age (Campanella & Rovee-Collier, 2005), but only if infants are allowed to practice the behavior they were shown. By 12 months of age, infants no longer need to practice the behavior in order to retain the memory for four weeks (Klein & Meltzoff, 1999).

Language Development

Our vast intelligence also allows us to have **language**, *a system of communication that uses symbols in a regular way to create meaning*. Language gives us the ability to communicate our thoughts to others by talking, reading, and writing. Although other species have at least some ability to communicate, as far as we know, none of them have language. There are many components of language that will now be reviewed.

Components of Language

Phoneme: A **phoneme** is *the smallest unit of sound that makes a meaningful difference in a language*. The word "bit"

has three phonemes. 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.

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).

Infants are born able to detect all phonemes, but they lose their ability to do so as they get older; by 10 months of age a child's ability to recognize phonemes becomes very similar to that of the adult speakers of the native language. 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*. Some morphemes are prefixes and suffixes used to modify other words. For example, the syllable "re-" as in "rewrite" or "repay" means "to do again," and the suffix "-est" as in "happiest" or "coolest" means "to the maximum."

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.

Syntax: 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 meaning of the sentence "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.

Language Developmental Progression

An important aspect of cognitive development is language acquisition. The order in which children learn language structures is consistent across children and cultures (Hatch, 1983). Starting before birth, babies begin to develop language and communication skills. At birth, babies recognize their mother's voice and can discriminate between the language(s) spoken by their mothers and foreign languages, and they show preferences for faces that are moving in synchrony with audible language (Blossom & Morgan, 2006; Pickens et al., 1994; Spelke & Cortelyou, 1981).

Do newborns communicate? Of course, they do. They do not, however, communicate with the use of oral language. Instead, they communicate their thoughts and needs with body posture (being relaxed or still), gestures, cries, and facial expressions. A person who spends adequate time with an infant can learn which cries indicate pain and which ones indicate hunger, discomfort, or frustration.

Figure 3.26

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 a 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 is not. 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).

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 an infant'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.

Understanding. 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.

Holophrasic speech. 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 ga da" to which the parent explains means, "I want some milk when I go with Daddy."

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 the 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". The first error is often the result of children learning the meaning of a word in a specific context, while the second language error is a function of the child's smaller vocabulary.

First words and cultural influences. If the child is using English, first words 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 (Imai et al., 2008).

Two-word sentences and telegraphic (text message) 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 spoken, 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."

Infant-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 **infant-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. Adults may use this form of speech 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.

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). First to be discussed are the biological theories, including nativist, brain areas and critical periods. Next, learning theory and social pragmatics will be presented.

Nativism. The linguist Noam Chomsky is a believer in the nature approach to language, arguing that human brains contain a **language acquisition device** (LAD) 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.

Figure 3.27. Noam Chomsky

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.

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 3.28). 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.*

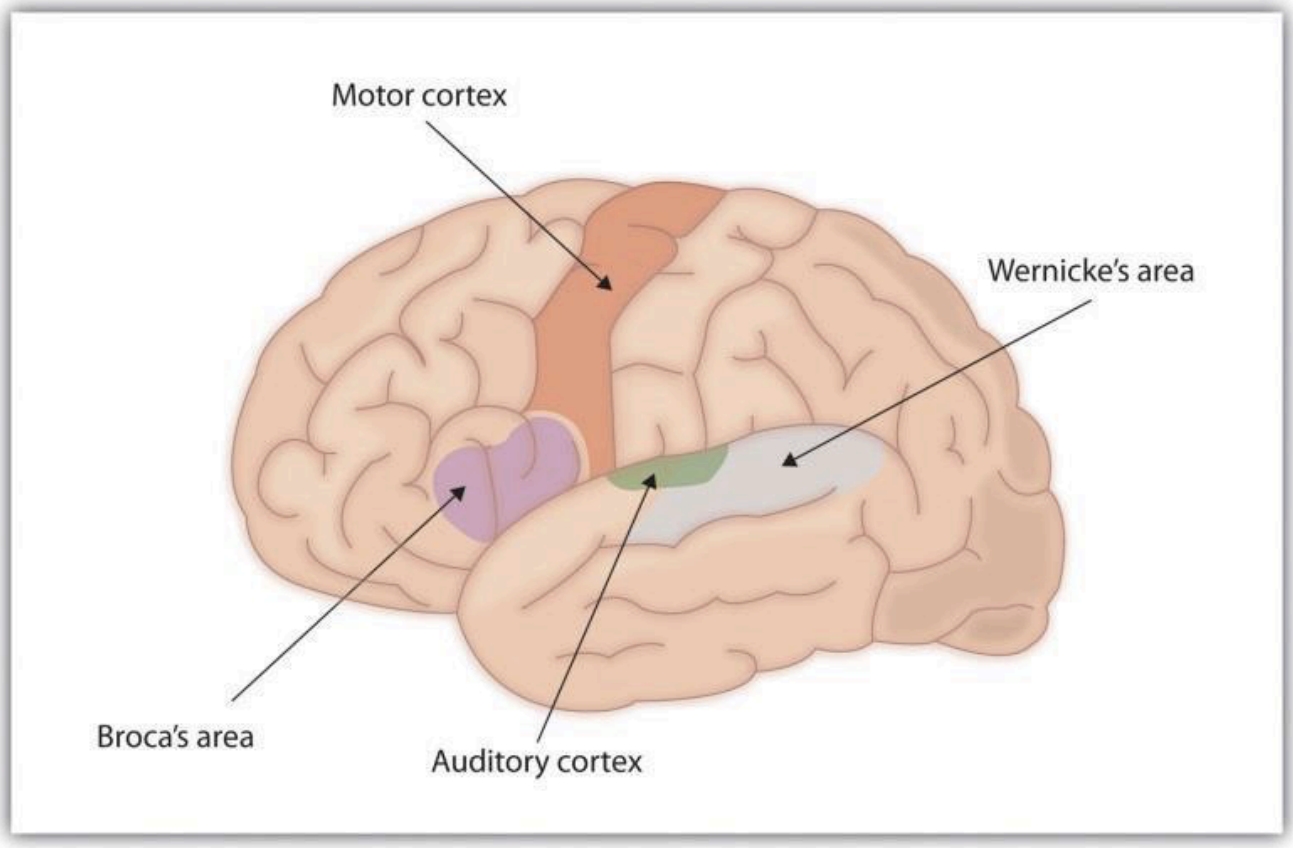

Figure 3.28. Drawing of Brain Showing Broca's and Wernicke's Areas
For most people the left hemisphere is specialized for language. Broca's area, near the motor cortex, is involved in language production, whereas Wernicke's area, near the auditory cortex, is specialized for language comprehension.

Figure 3.29. Victor

Is there a critical period for learning language? Psychologists believe there is a **critical period,** *a time in which learning can easily occur*, for language. This critical period appears to be between infancy and puberty (Lenneberg, 1967; Penfield & Roberts, 1959), but isolating the exact timeline has been elusive. Children who are not exposed to language early in their lives will likely never grasp the grammatical and communication nuances of language. Case studies, including Victor the "Wild Child," who was abandoned as a baby in 18th century France and not discovered until he was 12, and Genie, a child whose parents kept her locked away from 18 months until 13 years of age, are two examples of children who were deprived of language. Both children made some progress in socialization after they were rescued, but neither of them ever developed a working understanding of language (Rymer, 1993). Yet, such case studies are fraught with many confounds. How much did the years of social isolation and malnutrition contribute to their problems in language development?

A better test for the notion of critical periods for language is found in studies of children with hearing loss. Several studies show that the earlier children are diagnosed with hearing impairment and receive treatment, the

better the child's long-term language development. For instance, Stika et al. (2015) reported that when children's hearing loss was identified during newborn screening, and subsequently addressed, the majority showed normal language development when later tested at 12-18 months. Fitzpatrick, Crawford, Ni, and Durieux-Smith (2011) reported that early language intervention in children who were moderately to severely hard of hearing, demonstrated normal outcomes in language proficiency by 4 to 5 years of age. Tomblin et al. (2015) reported that children who were fit with hearing aids by 6 months of age showed good levels of language development by age 2. Those whose hearing was not corrected until after 18 months showed lower language performance, even in the early preschool years. However, this study did reveal that those whose hearing was corrected by toddlerhood had greatly improved language skills by age 6. The research with hearing impaired children reveals that this critical period for language development is not exclusive to infancy, and that the brain is still receptive to language development in early childhood. Fortunately, it is has become routine to screen hearing in newborns, because when hearing loss is not treated early, it can delay spoken language, literacy, and impact children's social skills (Moeller & Tomblin, 2015).

Figure 3.30. B.F. Skinner

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 in language skills over 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 communicate using 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.

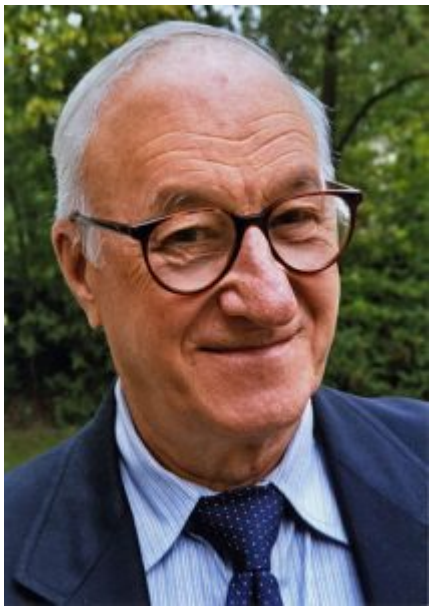

Figure 3.31. Albert Bandura

Social pragmatics. Another view emphasizes the very social nature of human language. 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 showing 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 will make linguistic repairs. This would suggest that children are using language not only as a means of achieving some material goal, but also to make themselves understood in the mind of another person.

Supplemental Materials

Planful Problem-solving during Late Infancy

To give you a sense of what infants' cognitive capacities allow them to do, here are some video clips of planful problem-solving at 8 months and about a year old:

How do I get off this bed?

How can I stack these blocks?

How do I get into the zoo?

How do we both get on the bed?

Optional Reading: The Brain in the First Two Years

Some of the most dramatic physical change that occurs during this period is in the brain. We are born with most of the brain cells that we will ever have; that is, about 85 billion neurons whose function is to store and transmit information (Huttenlocher & Dabholkar, 1997). While most of the brain's neurons are present at birth, they are not fully mature. During the next several years **dendrites**, *or branching extensions that collect information from other neurons*, will undergo a period of exuberance. Because of this proliferation of dendrites, by age two a single neuron might have thousands of dendrites. **Synaptogenesis**, *or the formation of connections between neurons*, continues from the prenatal period forming thousands of new connections during infancy and toddlerhood. *This period of rapid neural growth is referred to as* **synaptic blooming**.

The blooming period of neural growth is then followed by a period of **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 (Kolb & Whishaw, 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). Blooming occurs during the first few years of life, and pruning continues through childhood and into adolescence in various areas of the brain.

Another major 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 enhances the building of neural pathways and improves coordination and control of movement and thought processes. The development of myelin continues into adolescence but is most dramatic during the first several years of life.

The infant brain grows very fast. At birth the brain is about 250 grams (half a pound) and by one year it is already 750 grams (Eliot, 1999). Comparing to adult size, the newborn brain is approximately 33% of adult size at birth, and in just 90 days, it is already at 55% of adult size (Holland et al., 2014). 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 (see Figure 3.3), 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* (Jarrett, 2015).

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, that is located behind the forehead, is the least developed (Giedd, 2015). As the prefrontal cortex matures, the child is increasingly able to regulate or control emotions, to plan activities, strategize, and have better judgment. This is not fully accomplished in infancy and toddlerhood, but continues throughout childhood, adolescence and into adulthood.

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).

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*. The control of some specific bodily functions, such as movement, vision, and hearing, is performed in specified areas of the cortex, and if these areas are damaged, the individual will likely lose the ability to perform the corresponding function. The brain's neurons have a remarkable capacity to reorganize and extend themselves to carry out these particular functions in response to the needs of the organism, and to repair any damage. As a result, the brain constantly creates new neural communication routes and rewires existing ones. 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. Adult brains demonstrate neuroplasticity, but they are influenced less extensively than those of infants (Kolb & Fantie, 1989; Kolb & Whishaw, 2011).

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Parenting

Parenting Styles

Figure 4.1

Relationships between parents and children continue to play a significant role in children's development during early childhood. As children mature, parent-child relationships naturally change. Preschool and grade-school children are more capable, have their own preferences, and sometimes refuse or seek to compromise with parental expectations. This can lead to greater parent-child conflict, and how conflict is managed by parents further shapes the quality of parent-child relationships.

Baumrind (1971) identified a model of parenting that focuses on the level of control/ expectations that parents have regarding their children and how warm/responsive they are. This model resulted in four parenting styles. In general, children develop greater competence and self-confidence when parents have high, but reasonable expectations for children's behavior, communicate well with them, are warm, loving and responsive, and use reasoning, rather than coercion as preferred responses to children's misbehavior. This kind of parenting style has been described as **authoritative** (Baumrind, 2013). *Authoritative parents are supportive and show interest in their kids' activities but are not overbearing and allow them to make constructive mistakes.* Parents allow negotiation where appropriate, and consequently this type of parenting is considered more democratic.

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 holding expectations of children that are below what could be reasonably expected from them.* 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 fail to learn self-discipline and may feel somewhat insecure because they do not know the limits.

Uninvolved *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).

Keep in mind that most parents do not follow any model completely. Real people tend to fall somewhere in between these styles. 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 his or her 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. Additionally, parenting styles may reflect the type of parenting someone saw modeled while growing up.

Culture. The impact of culture and class cannot be ignored when examining parenting styles. The model of parenting described above assumes that the authoritative style is the best because this style is 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. However, in "collectivistic" cultures such as China or Korea, being obedient and compliant are favored behaviors. Authoritarian parenting has been used historically and reflects 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 societies where family members' cooperation is necessary for survival, rearing children who are independent and who strive to be on their own makes no sense. However, 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.

In a classic study on social class and parenting styles, Kohn (1977) explains 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.

Spanking

Spanking is often thought of as a rite of passage for children, and this method of discipline continues to be endorsed by the majority of parents (Smith, 2012). Just how effective is spanking, however, and are there negative consequences? After reviewing the research, Smith (2012) states "many studies have shown that physical punishment, including spanking, hitting and other means of causing pain, can lead to increased aggression, antisocial behavior, physical injury and mental health problems for children" (p. 60). Gershoff, (2008) reviewed decades of research and recommended that parents and caregivers make every effort to avoid physical punishment and called for the banning of physical discipline in all U.S. schools.

In a longitudinal study that followed more than 1500 families from 20 U.S. cities, parents' reports of spanking were assessed at ages three and five (MacKenzie, Nicklas, Waldfogel, & Brooks-Gunn, 2013). Measures of externalizing behavior and receptive vocabulary were assessed at age nine. Results indicated that those children who were spanked at least twice a week by their mothers scored 2.66 points higher on a measure of aggression and rule-breaking than those who were never spanked. Additionally, those who were spanked less, still scored 1.17 points higher than those never spanked. When fathers did the spanking, those spanked at least two times per week scored 5.7 points lower on a vocabulary test than those never spanked. This study revealed the negative cognitive effects of spanking in addition to the increase in aggressive behavior. 146

Internationally, physical discipline is increasingly being viewed as a violation of children's human rights. According to Save the Children (2019), 46 countries have banned the use of physical punishment, and the United Nations Committee on the Rights of the Child (2014) called physical punishment "legalized violence against children" and advocated that physical punishment be eliminated in all settings.

Many alternatives to spanking are advocated by child development specialists and include:

- Praising and modeling appropriate behavior

- Providing time-outs for inappropriate behavior
- Giving choices
- Helping the child identify emotions and learning to calm down
- Ignoring small annoyances
- Withdrawing privileges

Optional further reading:

Here is an article summarizing current research on the effects of spanking, which concludes with the recommendation that "parents should avoid physical punishment, psychologists should advise and advocate against it, and policymakers should develop means of educating the public about the harms of and alternatives to physical punishment" (Gershoff et al., 2018, p. 626)

Gershoff, E. T., Goodman, G. S., Miller-Perrin, C. L., Holden, G. W., Jackson, Y., & Kazdin, A. E. (2018). The strength of the causal evidence against physical punishment of children and its implications for parents, psychologists, and policymakers. *American Psychologist*, 73(5), 626-638.

Sibling Relationships

Figure 4.2

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 this is also tempered by the nature of the conflict. Abuhatoum and Howe (2013) found that coercive strategies (e.g., threats) were more common 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 is a very common strategy 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).

Supplemental Materials

- This episode of VICE takes a journey to Sweden and follows a gender non-conforming family to find out what it's like to grow up without the gender binary.

One or more interactive elements has been excluded from this version of the text. You can view them online here: *https://pdx.pressbooks.pub/humandevelopment/?p=5#oembed-1*

- This study explores how the typical parenting styles may not capture Latinx families well and underscores the importance of incorporating cultural context in any study of parenting.

  Domenech Rodríguez, M. M., Donovick, M. R., & Crowley, S. L. (2009). Parenting styles in a cultural context: Observations of "protective parenting" in first-generation Latinos. *Family Process, 48,* 195-210.

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Parenting and Families: Creating Supportive Higher Order Contexts

ELLEN SKINNER AND KRISTEN RAINE

Learning Objectives: Higher-order Contexts that Support Parents and Families

- What are "higher-order contexts of parenting" and why are they important?
- Explain three ways higher-order contexts can influence parenting and families.
- Give multiple examples of inequities in living conditions based on poverty (Evans reading) and racism (Trent et al. reading).
- In what ways can stress have an impact on parenting?
- Describe the assets and resiliency of families who raise children in developmentally hazardous contexts.
- Describe three ways we can improve higher-order contexts so they better support families.

Contextualist perspectives on development, like lifespan, ecological, and developmental systems approaches, highlight the important roles that ***social contexts*** play in all of our development. For example, research on child and adolescent development documents the central roles of parents, caregivers, and extended families. At the same time, parenting and families have social contexts of their own. Research on the cultural and societal forces that influence family functioning can help identify some of the contextual factors that make the task of parenting easier or harder.

The term "***higher-order contexts of parenting***" refers to factors that are operating on the "next level up" (i.e., higher-order) from parents themselves. So they could also be called "higher-level contexts" or "higher-order systems." These higher-order contexts can include marital relationship, families, extended families, neighborhoods, and communities. They keep going up to include cultural and societal structures or forces (like legal, educational, political, and economic systems). Parents are embedded in these contexts and we are interested in them because they can influence they way that individuals parent. In a systems view of parenting, research that includes these higher-order systems (like extended families) can provide a fuller explanation of why people parent the way they do.

We are especially interested in what Bronfenbrenner calls ***macrosystem factors,*** by which we mean societal and cultural factors that have an impact on families and parenting. To better understand the idea of "higher-order contexts of parenting," we examine two higher-order societal factors that exert a downward pressure on parenting, namely, ***status hierarchies of class*** (i.e., wealth and education or socioeconomic status, SES) and ***race*** (i.e., socially-assigned categories based on outward appearance).

By ***status hierarchies***, we mean that all societies endorse more or less explicit rank orderings of the value of different subgroups of people (Ridgeway, 2014). These societal ladders, which place subgroups on higher or lower rungs, matter to development because rank orderings grant subgroups more or less ***access to opportunitiesand resources***. Societies treat subgroups at the top and bottom of such hierarchies very differently and these ***inequities*** produce disparities in living

conditions, health, and functioning. Based on ***entrenched myths*** (i.e., prejudice and stereotypes), such disparities are often used as evidence of the inherent superiority of subgroups at the top and the inferiority of subgroups at the bottom. If subgroups object to the injustice of hazardous conditions and entrenched myths, they are handed ***cover stories***, which insist that people at the bottom have only themselves to blame for these inequities. In trying to raise their families, parents have to deal with both hazardous objective living conditions, and the effects of entrenched myths and cover stories.

There are three major ways that status hierarchies, like those organized around class and race, make parenting harder:

1. Inequities create objective living conditions that are developmentally hazardous to children and families;
2. Hardships and discrimination force people to parent under stressful conditions; and
3. Families must expend effort to counteract the pervasive effects of discrimination and prejudice on the development of their children and adolescents.

Optional Reading: Macrosystems of Development

If you would to learn more about societal *status hierarchies*, for example, how they are created and enforced, and the kinds of research that document their effects, we have created an optional supplementary essay that delves deeper into these issues. [**Macrosystems of Development (pdf)**]

Developmentally Hazardous Living Conditions

Status hierarchies based on ***class*** and ***race*** mean that, depending on where a family falls on these ladders, they are parenting in different worlds. Children and families at the bottom of multiple status hierarchies are particularly at risk for developmentally hazardous living conditions and other inequities. The compounding of environmental risk is especially troubling because racial/ethnic minority children are up to three times more likely than their white counterparts to be living in families with incomes below the poverty line. For example, according to the US Census Bureau, in 2018, of all the white children in this country under the age of 6, 9.1% lived in families with incomes at or below the poverty line; of Asian-American children, 11.2%. However, among Latinx children, more than twice as many, 24.3%, lived in poverty, and for Black children, more than three times, or 32.4%; this rate is probably similar for Indigenous children.

Poverty and racism create objectively different living conditions for children and youth. As summarized in the required readings (Evans, 2004; Trent, Dooley, & Dougé, 2019), inequities start with differential access to the basics of life: healthy food, secure housing, and health care. Poor children are exposed to more violence, instability, chaos, turmoil, and family separation. Neighborhoods with higher concentrations of poverty are more dangerous, offer fewer municipal services, suffer greater physical deterioration, and contain fewer amenities (e.g., community centers, playgrounds, parks). Schools and daycare are of lower quality. Disparities by class and race are found in opportunities for higher education, employment, and economic advancement. There are even differences in the quality of the air children breathe and the water they drink (Taylor, 2014). Such disparities are so significant that they register in differential physical health and mortality rates for children from different racial/ethnic groups and levels of SES (e.g., Council on Community Pediatrics, 2016). All of these objective disparities make the job of caring for a family more difficult. Researchers have concluded that it is not any one factor, but the ***accumulation of multiple environmental risks*** that make these living conditions so risky (e.g., Evans, Li, & Whipple, 2013).

The developmentally hazardous conditions in which many poor and minority children grow up can be thought of as ***societally sanctioned***. By this we mean that our society has decided that children only get as much of the basics needed for their healthy development as their families can afford. Outside the US, many societies have decided that *all* children should breathe clean air and drink clean water, by enforcing statutes that make pollution illegal and thereby preventing concentrations of pollution in neighborhoods with high concentrations of poverty. Or they legislate mixed-income housing, so there *are* no neighborhoods with concentrations of poverty. Or they decide that everyone should have access to healthy food, secure housing, and affordable health care. Some societies invest in the infrastructure and safety of all communities, so that low wealth neighborhoods still have community centers, farmer's markets, and parks. Or they fully fund all schools and provide free access to a high-quality college education. In some societies, there is a threshold below which the living conditions of children and families are not allowed to fall. All families have ***the right to these developmental basics***. In these societies, the disparities in living conditions between the richest and poorest children are not as stark, and conditions for the poorest children are not developmentally dangerous.

REQUIREDReading: Integration of research on the effects of childhood poverty

Evans, G. (2004). The environment of childhood poverty. *American Psychologist*, 59, 77-92.

This short paper by Gary Evans (Evans, 2004) is a required reading for human development because it summarizes the developmentally hazardous conditions experienced by children at the bottom of the SES hierarchy. This report is especially sobering because the poorest subgroup in the US is made up of children–children under the age of 6 to be exact (National Center for Children in Poverty, 2018). It can be discouraging to read about the long list of risky conditions that poor children face, but this information is a crucial step toward deciding as a society the kinds of living conditions in which we want our children to grow up.

Although this paper was written in 2004, the conditions it describes continue to be true TODAY.

***REQUIRED* Reading: Integration of research on the effects of racism on child and adolescent health and development**

Trent, M., Dooley, D. G., & Dougé, J. (2019). The impact of racism on child and adolescent health. *Pediatrics*, 144(2), e20191765.

This short paper, commissioned by the American Academy of Pediatrics (AAP), is a required reading for this class because it provides an overview of research on the harmful effects of racism on child and adolescent health and development. It ends with a series of recommendations for ways in which pediatricians and the AAP can help to protect children and adolescents from these effects, and at the same time transform pediatric training and practice to work toward more just and equitable healthcare systems.

Tip for class projects. The recommendations at the end of this paper provide a good example of how developmental contexts can be improved, and may inspire you and your group as you work on plans to reimagine and reinvent your target developmental contexts.

Parenting Under Stress

A second way that status hierarchies exert a downward pressure on children and families is that people are forced to do their caregiving under very stressful conditions. The objective hardships, discrimination, and prejudice some families face create an unsupportive context for the important job of parenting and providing for a family, which are challenging tasks even under the best of circumstances. Most parents and families rise to these challenges, but few people parent their best under such adversity.

When studying parents and families, and especially when examining parenting practices that seem problematic, it is essential to view them in context. Some practices, for example, extremely strict parenting, are connected with authoritarian styles (a combination of high demands for obedience with low warmth and affection) and undesirable outcomes in white middle class children and youth. In other racial/ethnic groups, however, extremely strict parenting is often accompanied by high parental warmth and affection (creating a parenting style not yet captured in standard typologies that might be called "protective"). Children and adolescents may see their parents as demanding but fair, their behavior grounded in love and genuine concern for their welfare. For example, an indigenous practice endorsed by native and immigrant Chinese parents called "training" is rooted in Confucian tradition and emphasizes strict parental control and guidance of children's behaviors through parental devotion, involvement, and monitoring (Chao, 2000). In these cases, "harsh" parenting may have different consequences. As well as different antecedents– within communities of color and immigrant communities, parents may prioritize keeping children safe under dangerous conditions where disobedience can have serious consequences.

All children need and deserve high quality parenting, and are not to blame if their parents and families are not able to meet their needs. An idea relevant to everyone, but especially important to students whose families are at the bottom of multiple status hierarchies, is the concept of "***inter-generational trauma***" [pdf]. This notion is especially useful for conceptualizing the ways that histories of discrimination and prejudice, as seen in the childhoods and lives of their parents and grandparents, can help students understand some of the ways that unresolved post-traumatic stress may have shaped their families while they were growing up. During the period of emerging adulthood, young people begin to be able to see their parents as whole people, operating within powerful histories and societal forces not of their own making. We try to help students understand that at every rung in our status hierarchies all parents at times show behaviors that are self-centered, neglectful, inconsistent, or unfair. And that parents who are sometimes harsh or rejecting, are also sometimes loving, caring, warm, and affectionate. All parents make mistakes, and most recognize and regret any harm they have done to their children. Like everyone else, parents are growing and developing.

Over time, many students come to appreciate and admire what their parents have been able to accomplish, and respect their protective efforts and the lessons they tried to teach, while also acknowledging the work we all still have to do on unresolved issues left over from our childhood experiences. Students are reassured by research showing that most people, even those who experience extreme adversity as children, are resilient, able to recover and heal, and go on to lead productive adult lives and provide excellent parenting for their own children. Many people report that some of the most theraputic activities involve beginning to create families of their own that provide children and youth (whether biological, adopted, foster, nieces, nephews, or neighborhood children) stable and loving childhood experiences.

Counteracting Prejudice and Discrimination

A third way that status hierarchies make parenting harder is that parents must work to protect their offspring from the effects of entrenched myths societies hold about subgroups on the lower rungs. Families must teach children and adolescents how to cope constructively with prejudice and discrimination (e.g., Jones et al., 2020).

For example, research on ***implicit bias*** suggests that societal prejudices about race and class are widespread. Now think of all the people with whom children and youth interact in the settings of their everyday lives: At school (classmates, peers, teachers, guidance counselors), in the neighborhood (friends, neighbors, shopkeepers, medical professionals, social workers, police officers, prosecutors, judges), and eventually at universities and work. We can keep on going up the levels of the macrosystem, considering social media, politics, science, and so on. Parents are right to worry about

what happens when their offspring spend much of their lives being taught, guided, judged, and hired by people who unconsciously regard them as "less than." Parents spend a great deal of time and energy working with these systems to make sure that their children and youth are treated fairly.

One of the most eye-opening effects of status hierarchies is that children are introduced to the core idea underlying them, namely, that ***some subgroups of people are of greater value than others***. Few endorse this idea in the abstract. Most people would never say that boys are worth more than girls, or people with a lot of money are better than people without, or white people are more valuable than people of color. But we have to come to grips with the fact that, whether we admit it or not, status hierarchies clearly communicate these messages to children (e.g., Ruck, Mistry, & Flanagan, 2019).

Since categories are ***socially constructed***, children first have to be taught to recognize them. They slowly learn, for example, that this society makes a big deal of the characteristics we call "race" and the qualities we assign to "money." Then, as children directly experience and observe the ways that people are treated differently based on category membership, they begin to understand what it means to belong to different ranks on that category. Finally, as children come to see where they themselves fall on those rankings, for example, on subgroups we call "race," we can say that children have been "racialized." They see themselves and their identity in terms of those categories and the values they have been assigned. They are introduced to the societal idea of hierarchies of human value, and they are shown where they belong on these different hierarchies.

Research shows that, to counteract these potentially harmful influences, poor and minority families draw on a variety of ***strengths and assets,*** including proficiencies and protective factors not typically found in the repertoire of white middle class families, such as processes through which families constructively deal with ongoing racial/ethnic discrimination (e.g., Gaylord-Harden, Burrow, & Cunningham, 2012). Chief among these assets are supportive extended family networks, close-knit communities, cultural traditions and practices, familial racial/ethnic socialization, and social activism.

Families prioritize and cherish their children and youth, and together, these community strengths contribute to the development of positive racial/ethnic identities, instill cultural pride, teach adaptive ways of coping with adversity, and model civic participation in movements for social justice.

REQUIRED Video: The Story We Tell about Poor People Isn't True

To continue the process of reworking entrenched myths, we ask students to watch this short video by Mia Birdsong, who focuses her TED talk on the true story of the creativity, resourcefulness, grit, and determination shown by poor people. Her goal is to change attitudes of decision-makers so that policies and practices can more equitably support poor people in finding ways to generate income while supporting their communities.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=706#oembed-1

Incorporating Traditional Culture into Positive Youth Development for American Indian and Alaska Native Youth

Fascinating frameworks focus on the positive development of *American Indian and Alaska Native* (AI/AN) *children and youth* (e.g., Kenyon and Hanson, 2012) and highlight ways that traditional worldviews, values, rituals, and practices can provide a scaffold for interventions, programs, and practices that support children and adolescents. To give youth a strong sense of tribal heritage, identity, and belonging, programs are anchored in relational native worldviews and include activities like elders' instruction in tribal history, storytelling, drumming, singing, language, traditional art and craftwork, sacred ceremonies, outdoor activities, cultural events, and social justice projects. From this perspective, deep connections to culture and heritage *are* prevention, meaning that engaging AI /AN youth in cultural practices and reinforcing traditional Native worldviews serve to bolster positive development.

Kenyon, D. B., & Hanson, J. D. (2012). Incorporating traditional culture into positive youth development programs with American Indian/Alaska Native youth. *Child Development Perspectives*, 6(3), 272-279.

Critiques and Next Steps in the Study of Higher-order Contexts of Parenting

Over the last several decades mainstream developmental science has been actively criticized for its approach to studying the development of poor and minority children, youth, and families (e.g., Coll et al., 1996; Spencer, 1990). Three sets of serious critiques have been leveled.

Inclusive Models of Higher-order Contexts

First, developmental models of higher-order contexts rarely included the ***dominant social hierarchies*** created by ***race/ethnicity and class*** (and gender, sexual orientation, etc.). These societal conditions create troubling realities involving prejudice and discrimination that children and adolescents encounter on a daily basis, and without them, it is impossible to construct a full account of the causal forces shaping their development. These same factors also affect children from dominant groups, who in many ways are the beneficiaries of systems that advantage the subgroups to which they belong. Yet up until recently these forces seemed to be largely invisible to mainstream researchers, who are overwhelmingly white and middle class.

More inclusive contextual models incorporate these realities, for example, the ***phenomenological variant of ecological systems theory*** (PVEST; Spencer, 2006; Spencer, Dupree, & Hartmann, 1997) [pdf], and the ***integrative model for the study of developmental competencies in minority children*** (Coll et al., 1996). Drawing on social stratification theory and other sociological approaches, they highlight the role of ***positionality*** or ***intersectionality*** (an individual's, family's, or subgroup's location in a particular societal context on the multiple status hierarchies of race, class, gender, and so on; Crenshaw, 1989, 1991) in determining access to power, resources, and opportunities, and in shaping identities and corresponding biases and viewpoints. These more complex conceptualizations of higher-order contexts enrich our understanding of the development of all children and families.

Cultural Wealth of Poor and Minority Children, Youth, and Families

Second, mainstream researchers have been taken to task for bringing a predominantly ***deficit lens*** (Valencia & Solórzano, 1997) to the study of the development of poor and minority children and families. Researchers largely focused on the problems these subgroups experience, describing children and youth as "at-risk" and "vulnerable." Moreover, researchers often argued (typically without evidence) that the disparities they found in children's outcomes were

due to problems stemming from children themselves or from their parents, families, or cultures, labeling them as "disadvantaged." Researchers seemed to forget that the majority of poor and minority children develop along adaptive and healthy pathways, and to overlook the strengths and assets of their families and communities.

In response to these deficit assumptions, there has been a push to study the ***positive development*** of minority children and youth (e.g., Cabrera, 2013; Cabrera, Beeghly, & Eisenberg, 2012). This approach, as seen in the recent publication of the first ***Handbook on Positive Development of Minority Children and Youth*** (Cabrera & Leyendecker, 2017), highlights a strength-based view that focuses on positive adaptation, competence, and resilience and the factors that enable such healthy development. As feminists pointed out in the study of girls, growing up female and raising female children within higher-order systems that label and treat girls differently even before they are born is a challenging task (Robnett, Daniels, & Leaper, 2018). One way researchers can help is by assuming that girls' families and communities are finding multiple creative and courageous ways to support their girls and young women so they grow up into strong and resilient people, whole and magnificent, who will be ready to do their parts to change these discriminatory societal conditions and narratives. Poor and minority children and families deserve the same clarity of understanding.

To counteract deficit assumptions, the last few decades have seen an outpouring of research documenting the ***cultural wealth*** of historically marginalized communities (e.g., Yosso, 2005 [pdf]). Some of the most interesting research on children and families today lifts up and learns from the cultural resources created and preserved by Black, Native, Latinx, Asian-American, immigrant, deaf, and LGBTQ+ communities, as well as countless others. Their cultural knowledge and wisdom enable them to prepare children not only to negotiate the developmental tasks faced by all children and youth, but also to deal with obstacles that families higher on the status hierarchy do not have to face, such as coping constructively with ongoing inequities and entrenched myths. Communities also have a wealth of knowledge and experience in resisting oppression and fighting for social justice, valuable expertise that is often lacking in mainstream families. Minority, immigrant, and poor communities have much to offer children and youth, and also the larger society of which they have always been an integral part and to which they have always made crucial, although often unacknowledged, contributions.

Future Directions

Developmentalists who study the effects of higher-order contexts on the functioning of children and families must be very thoughtful. On the one hand, they want to catalog as accurately and clearly as they can the human costs of growing up and trying to raise children in developmentally dangerous conditions. They hope that the pervasive inequities they document can be used as a basis for supporting collective efforts at societal change. On the other hand, they do not want to be cogs in the societal machine that reinforces entrenched prejudices and stereotypes. They do not want their research to be used to imply that children and families are "less than" in any way. On the third hand, researchers cannot let the positive development of most poor and minority children and the cultural and family strengths of racial/ethnic and low wealth communities be used as an excuse not to tackle the status hierarchies that produce poverty and racism head on (Brown, Mistry, & Yip, 2019; Killen, Rutland, & Yip, 2016).

Research as a Call to Action

Research on widespread inequities and their effects on children and families motivate researchers to participate in ***collective action*** to right these injustices. There are ***severalstrategies*** societies can use.

- We can ***de-couple families' positions*** on status hierarchies from ***access to the basic conditions*** their children need for healthy development. For example, we can ensure that all neighborhoods are safe, and include affordable housing and access to healthy food.
- For hierarchies like class, we can work to ***get rid of such big disparities between the rungs***, by prioritizing actions that ***reduce income inequality***. For example, we can increase the minimum wage to a living wage, focus on job creation and training, and increase opportunities for meaningful employment. Key to both these strategies is

access to free high-quality education from cradle to college graduation, because educational achievement is the most effective way to move up societal ladders.

- The most important strategy, of course, is to ***reinvent higher-order contexts themselves by surfacing and demolishingsocietal hierarchies of human worth***. From this perspective the two strategies described above are first steps toward this ultimate goal. Researchers who favor this strategy actively critique other interventions that focus on "fixing" individuals (e.g., children or their parents) and then plonking them back into hazardous developmental conditions. Researchers argue that strategies focused on transforming higher-order contexts are both more equitable and more effective, so in the end, they are much less expensive– in terms of both monetary and human costs.

Poor People's Campaign: A Call for Basic Human Rights

If you are interested in learning more about grassroots political movements aimed at lifting people out of poverty and providing basic necessities for everyone, a great place to start is with the website for the ***Poor People's Campaign***. https://www.poorpeoplescampaign.org/

Take Home Messages about Higher-Order Contexts of Parenting

We emphasize four big ideas from this reading:

1. Poverty and racism create ***objectively different living conditions*** for children and youth. Caregivers and families at the bottom of hierarchies (especially at the bottom of multiple hierarchies) face unnecessary hardships in the objective living conditions under which they are forced to raise their children. Using Bronfenbrenner's ecological terms, the effects of poverty and racism pervade all the ***microsystems*** that shape the development of children and youth (homes, schools, neighborhood, social work, juvenile justice system, etc.).
2. The objective hardships, discrimination, and prejudice some families face create an ***unsupportive context*** for the important tasks of parenting and providing for a family, which are challenging even in the best of circumstances. Most parents and families rise to these challenges, but few people parent their best under such hardships and stresses. The notion of "***inter-generational trauma***" may be useful for conceptualizing how histories of discrimination and prejudice, as seen in the childhoods and lives of parents and grandparents, can help to explain some of the ways that unresolved post-traumatic stress shapes families and parenting.
3. Through their ***strength*** and ***resilience***, minority and low wealth communities ***protect and support children and youth***, and help them build developmental competencies. Among these ***cultural assets*** are supportive extended family networks, close-knit communities, cultural traditions and practices, familial racial/ethnic socialization, and social activism. Families prioritize and cherish their children and youth, and contribute to the development of positive racial/ethnic identities, instill cultural pride, teach adaptive ways of coping with adversity, and model civic participation in social justice movements.
4. Over the last several decades developmentalists have more fully incorporated the roles of status hierarchies into their ***models of lifespan development***, replacing deficit lenses with more accurate understandings of the ***positive development of minority children and youth***, and their supportive extended families, communities, and cultures. Because of the hazardous developmental conditions status hierarchies create, many developmentalists are working on a ***transformation agenda***, to reinvent societal systems so they can be more supportive of all children, youth, and families.

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Supplementary Learning Materials

We invite you to find readings on ***cultural assets*** that appeal to you. Select ones that focus on a community to which you belong or one about which you would like to learn more. Here are some papers on parenting and families in ethnic/minority and immigrant communities and you can easily locate more readings and videos. We encourage you dive right in!

- The ***Cultural-Asset Framework*** focuses on the resources and practices that support the positive development of ***African American children and youth*** in the face of racial discrimination (Gaylord-Harden et al., 2012). For example, it highlights the protective roles of racial socialization, strong and positive racial identities, and culturally-relevant forms of adaptive coping, such as communalistic and spiritually-based coping strategies.

  Gaylord-Harden, N. K., Burrow, A. L., & Cunningham, J. A. (2012). A cultural-asset framework for investigating successful adaptation to stress in African American youth. *Child Development Perspectives*, 6(3), 264-271.

- Interesting frameworks also focus on ***positive development of Asian-American (AA) children and youth*** (e.g., Zhou et al., 2012). ***Assets*** and ***protective factors*** for AA youth have been found within children themselves (e.g., maintenance of heritage culture, bilingualism, coping, and emotion regulation), as well as in families (e.g., authoritative parenting and parental support) and neighborhoods (e.g., ethnic composition).

    Zhou, Q., Tao, A., Chen, S. H., Main, A., Lee, E., Ly, J., ... & Li, X. (2012). Asset and protective factors for Asian American children's mental health adjustment. *Child Development Perspectives*, 6(3), 312-319.

- Other researchers provide reviews of specific socializers, for example, Cabrera and Bradley (2012) focus on the important and changing ***role of Latino fathers***.

    Cabrera, N. J., & Bradley, R. H. (2012). Latino fathers and their children. *Child Development Perspectives*, 6(3), 232-238.

- This handbook provides dozens of chapters focusing on the positive development of minority children and youth. Pick your favorite topic!

    Cabrera, N. J., & Leyendecker, B. (Eds.). (2017). *Handbook on positive development of minority children and youth*. New York, NY: Springer.

Self-Regulation

Developmental Task of Early Childhood: Initiative vs. Guilt

The trust and autonomy of previous stages develop into a desire to take initiative or to think of ideas and initiate action (Erikson, 1982). Once children reach the preschool stage (ages 3–6 years), they are capable of initiating activities and asserting control over their world through social interactions and play. According to Erikson, preschool children must resolve the task of **initiative vs. guilt**. By learning to plan and achieve goals while interacting with others, preschool children can master this task. Children may want to build a fort with the cushions from the living room couch or open a lemonade stand in the driveway or make a zoo with their stuffed animals and issue tickets to those who want to come. Or they may just want to get themselves ready for bed without any assistance. Initiative, a sense of ambition and responsibility, occurs when parents allow a child to explore within limits and then support the child's choice. To reinforce taking initiative, caregivers should offer praise for the child's efforts and avoid being critical of messes or mistakes. Placing pictures of drawings on the refrigerator, purchasing mud pies for dinner, and admiring towers of legos will facilitate the child's sense of initiative. These children will develop self-confidence and feel a sense of purpose. Those who are unsuccessful at this stage—with their initiative misfiring or stifled by over-controlling parents—may develop feelings of inadequacy and guilt.

Behavioral and Emotional Self-Regulation

One of the places that the developmental task of initiative vs. guilt is negotiated involves preschoolers' struggles to learn to control their behaviors and emotions. **Behavioral self-regulation** *refers broadly to the self-control individuals use to modify their actions.* Sometimes, behaviors need to be modified to so that they are socially appropriate to the context (e.g., minding parents or following preschool rules), and sometimes so that they better meet an individual's own goals (e.g., getting a fort built or joining a pretend game). Adaptive behavioral regulation involves staying in touch with your genuine goals while at the same time making intentional decisions about the actions you are going to show in service of those goals.

Self-regulation of behavior refers to both:

1. "Do" regulation: The performance of actions desired by others that we don't really want to do ("Put away your toys"), and
2. "Don't" regulation: Stopping ourselves from doing something we really want to do ("Don't eat that cookie!").

During toddlerhood, we see the start of behavioral self-regulation, and it is one of the central tasks of early childhood, but these processes take many years to fully develop. **Executive function** refers to self-regulatory processes, such as the ability to inhibit a 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. As executive function improves, children become less impulsive (Traverso, Viterbori, & Usai, 2015). Children show higher executive function skills when parents are warm and responsive, use scaffolding when the child is trying to solve a problem, and provide cognitively stimulating environments (Fay-Stammbach, Hawes & Meredith, 2014).

When do children start self-regulating and what affects how it develops? Children start regulating their behaviors in infancy, beginning with physiological regulation and consistency in patterns of behavior, such as sleeping and eating. However, as infants move into toddlerhood, they are faced with the challenge of regulating their behavior as it relates to others in social situations. This type of self-regulation is typically not seen with any degree of consistency until a child's second year. However, the capacity to self- regulate may develop earlier or later depending on:

1. Developmental progress in other areas, such as cognition and working memory, which help children become aware of what constitutes acceptable social behavior.
2. The child's temperament, both reactivity and effortful control.
3. The quality of parent-child interactions.
4. The quality of the general home and/or school (day-care) environment.

Why is self-regulation important? Being good at behavioral self-regulation (compared to having difficulty regulating one's behavior) is associated with numerous positive outcomes for children, including:

1. More success in the transition to school and better academic achievement once they start school.
2. Higher levels of social competence, as seen in greater success developing school-based peer relationships.
3. Fewer problems with externalizing behaviors such as anger and impulsivity.
4. Higher levels of pro-social behaviors as children move from infancy into toddlerhood and early childhood, and increases in prosocial behavior throughout childhood.

In the now classic "Marshmallow Test" (Mischel, Ebbesen, & Zeiss, 1972) children are confronted with the choice of a small immediate reward (a single marshmallow) and a larger delayed reward (several marshmallows). Walter Mischel and his colleagues over the years have found that the ability to delay gratification at the age of four predicted better academic performance and health later in life (Mischel, et al., 2011).

How do we study it? The developmental trajectory for self-regulation can be investigated by directly observing the nature and frequency of children's compliant behaviors. **Compliance**, simply stated, is a *child's cooperation or "going along with" the rules and standards of behavior for their immediate environment* (e.g., home or school).

Internalization: How do self-regulation and compliance develop? As a child's ability to self-regulate develops, so does the nature of compliant behavior. Let's use getting ready to eat a meal as an example:

1. When self-regulated behavior is beginning to emerge, compliant behavior requires a high degree of caregiver support: A very young child will need assistance with hand washing, putting on a bib, and getting seated
2. Compliance needs less support as self-regulation continues to develop. A child of two may be able to perform these tasks with less or no assistance, but will likely require a reminder and perhaps direct supervision to do them.
3. Compliance needs very little direct support as children develop more and more self-regulatory skills.
4. Self-regulatory competence: An older child will be able to get ready for a meal without prompting or assistance.

In other words, as a child develops the ability to self-regulate their behavior, the nature of compliance shifts from assisted, externally motivated behavior to independent, internally motivated behavior. The development of independent, internally motivated compliance is referred to as **"*internalization*"** and represents a child's *acceptance and understanding of*, and willingness to behave in accordance with, the *rules and standards of their environment*.

Emotional self-regulation. Emotional self-regulation refers specifically to an individual's ability to recognize and name how they are feeling, and to express their emotions constructively. Adaptive emotion regulation involves staying in

touch with how you are genuinely feeling while at the same time making intentional decisions about how you are going to express those feelings. Three- and four-year-olds learn new ways of expressing their feelings verbally. They also learn how to cope with negative emotions in ways that make themselves feel better—they put their heads down to reduce sensory input that may be overwhelming or unpleasant, they talk out loud to reassure themselves that things will be okay, and they recalibrate their goals or desires to match the options that are available to them, rather than to continue asking for something they cannot have (Thompson & Goodvin, 2007). These strategies, and others, reduce the frequency and severity of tantrums, feelings of loneliness, and other unpleasant emotional responses. They can also help children remain calm when they are very excited or happy.

The same cognitive processes related to **self-control** and **executive function** (response initiation, response inhibition, delayed gratification, effortful control, and cognitive flexibility) are responsible for regulating children's emotions. However, caretakers can help facilitate adaptive behavior regulation by using goal-focused language (e.g., want, need, don't like) in everyday conversations, by validating children's goals and preferences as real and important, by explaining prosocial strategies that allow everyone in a given transaction to have their goals and preferences taken into consideration (e.g. by taking turns or sharing), and by being patient. Compared with children with poor behavioral regulation skills, those who learn adaptive behavioral and emotional regulation strategies learn more, like school better, and are disciplined less frequently. They are also less anxious and stressed, more empathetic, and get along better with parents, teachers, and peers (Chang et al., 2003; Colman et al., 2006; Eisenberg et al., 2005; Morris et al., 2011; Raikes et al., 2007; Rothbart et al., 2006).

Talking about Emotions
Here you have a little clip of a young child talking about his feelings. It may seem a little staged (or edited) but it's great to see such a young one in touch with those complex things we call emotions.
https://www.youtube.com/watch?v=UfApzcvPVlg

Social and Emotional Competence

Social and personality development is built from social, biological, and representational influences. These influences result in important developmental outcomes that matter to children, parents, and society: a young adult's capacity to engage in socially constructive actions (helping, caring, sharing with others), to curb hostile or aggressive impulses, to live according to meaningful moral values, to develop a healthy identity and sense of self, and to develop talents and achieve success in using them. These are some of the developmental outcomes that denote social and emotional competence.

These achievements of social and personality development derive from the interaction of many social, biological, and representational influences. Consider, for example, the development of conscience, which is an early foundation for moral development.

Conscience consists of the cognitive, emotional, and social influences that cause young children to create and act consistently with internalized standards of right and wrong (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 the ways 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).

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Cognitive Development

Piaget's Preoperational Stage

Building on the accomplishments of the first stage of cognitive development, which takes place during infancy and involves sensorimotor regulations, preschoolers enter the second stage of cognitive development, called the **preoperational stage**, which is organized around symbolic regulations. According to Piaget, this stage occurs from the age of 2 to 7 years. In the preoperational stage, children use **symbols** to *represent words, images, and ideas*, which is why children in this stage engage in pretend play. A child's arms might become airplane wings as she zooms around the room, or a child with a stick might become a brave knight with a sword. Children also begin to use language in the preoperational stage, but they cannot understand adult logic or mentally manipulate information. The term **operational** r*efers to logical manipulation of information*, so children at this stage are considered *pre*-operational. Children's logic is based on their own personal knowledge of the world so far, rather than on conventional knowledge.

The preoperational period is divided into two stages:

1. The **symbolic function substage** occurs between 2 and 4 years of age and is characterized by gains in ***symbolic thinking,*** in which the child is able to *mentally represent an object that is not present*, and a dependence *on* ***perception*** in problem solving.
2. The **intuitive thought substage**, lasting from 4 to 7 years, *is marked by greater dependence on intuitive thinking rather than just perception* (Thomas, 1979). This implies that children think automatically without using evidence. At this stage, children ask many questions as they attempt to understand the world around them using immature reasoning. Let us examine some of Piaget's assertions about children's cognitive abilities at this age.

Figure 5.1

Pretend play. Pretending is a favorite activity at this time. A toy has qualities beyond the way it was designed to function and can now be used to stand for a character or object unlike anything originally intended. A teddy bear, for example, can be a baby or the queen of a faraway land. Piaget believed that pretend play helped children practice and solidify new schemata they were developing cognitively. This play, then, reflected changes in their conceptions or thoughts. However, children also learn as they pretend and experiment. Their play does not simply represent what they have learned (Berk, 2007).

Symbolic representation. In addition to ushering in an era of pretend play, the development of symbolic representation revolutionizes the way young children can think and act. Representational capacities underlie the emergence of language which opens up channels of communication with others and provides young children words and concepts for their inner experiences (like emotion labels). Symbolic capacities also scaffold the development of memory, and allow young children to remember and discuss autobiographical events. They become very interested in two dimensional representations, like photographs and computer screens, and can interact with grandparents and others using these tools.

As seen at the end of the sensorimotor period, toddlers begin to use primitive representations to solve problems in their heads. During the preschool years, cognitive advances allow them to get better and better at trying out strategies

mentally before taking action. Hence, planning and problem-solving become central activities. Problem-solving can be used to facilitate physical play (e.g., planning how to build a castle), solve interpersonal conflicts (e.g., two children want the same toy), or figure out how to comfort oneself when one is sad.

Mental representations are also key to the advances in executive function and self-regulation described earlier. When children can hold goals in their minds that are different from the ones that spontaneously emerge, they use representations of what they are *supposed* to do to modulate or manage what they *want* to do. Young children show an outpouring of representational activities, including language, pretend play, story telling, singing, drawing, looking a photos, and discussing the past and present. They love to engage in joint problem-solving and be read to, often asking for the same book or video over and over again, pouring over and discussing the story, until they can repeat every word.

Despite the many advances that symbolic thought brings to young children, there are still several significant limitations to their thinking, including **egocentrism**, **perceptual salience**, and **animism**. When parents see behaviors typical of the preoperational stage, it is important that they correctly interpret their meaning. Young children are not being hard to get along with. These behaviors are the result of genuine limitations in their cognitive functioning. Young children can understand many ideas and follow rules, but for the best developmental outcomes, adults should temper their expectations and demands so that they are reasonable, and explain their thinking using language that is developmentally attuned to children's current cognitive capacities.

Egocentrism. Egocentrism in early childhood *refers to the tendency of young children not to be able to take the perspective of others, and instead the child thinks that everyone sees, thinks, and feels just as they do.* Egocentric children are not able to infer the perspective of other people and instead attribute their own perspective to everyone in the situation. For example, ten-year-old Keiko's birthday is coming up, so her mom takes 3-year-old Kenny to the toy store to choose a present for his sister. He selects an Iron Man action figure for her, thinking that if he likes the toy, his sister will too.

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 (see Figure 5.2). Children tend to choose a picture that represents their own, rather than the doll's view. By age 7 children are less self-centered. However, even younger children when speaking to others tend to use different sentence structures and vocabulary when addressing a younger child or an older adult. This indicates some awareness of the views of others.

Figure 5.2. What does dolly see?

Perceptual salience. Perceptual salience means that *children reason, not based on what they know, but based on what they perceive (ie.g., see and hear) in the present local context.* This cognitive limitation is on display every Halloween, when parents dress up, especially if they use masks. For a preoperational child, the mask is so perceptually salient that even if the parent continues to talk and the child can recognize their voice, their experience is overwhelmed by the transformation of the parent's face, that they react to the masked parent as if they were a stranger. At this age, children's understanding is halfway between the reasoning based on action of the sensorimotor period and the reasoning based on logic of the concrete operational period. During the preoperational period, reasoning is based on **empirical reality,** that is, information provided by the senses.

Animism. Animism *refers to attributing life-like qualities to objects.* The cup is 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. Cartoons frequently show objects that

appear alive and take on lifelike qualities. 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).

Intuitive substage (age 4-7 years). During the intuitive substage, children begin to move toward logical thinking. They show some signs of logical reasoning, but can't explain how or why they think as they do. This is an age filled with questions, as children begin to make sense of their worlds. Parents should know that children's ceaseless "why?" questions do not require detailed explanations. They are looking for brief and simple explanations. For example, if children ask "Why do I have to wear a helmet when I ride a bicycle?" they are not looking for a lecture on legal issues, but just a simple "To keep your head safe." Likewise, if they come back from a bike ride and say "Well, I didn't fall down, so now I don't need to wear a helmet any more", you can explain the idea of risk through an everyday example, saying, "You have to wear it every time, because you could fall down." If you want to try a metaphor, you could explain, " Your head is like a glass, it could get broken. Does a glass break every time you drop it? No. But does that mean that it's a good idea to drop it? No. We want to keep your head safe."

Centration. The primary limitation of thought during the intuitive substage is called **centration**. **Centration** means that understanding is dominated (i.e., centered on) a single feather– the most perceptually salient one. At this age, children cannot hold or coordinate two features of an object at the same time. Piaget demonstrated this aspect of preoperational thought in a series of experiments. They showed that young children do not yet have the logical notion of **conservation**, which refers *to the ability to recognize that aspects like quantity remain the same, even when over transformations in appearance.*

Inability to conserve. Using Kenny and Keiko again, dad gave a slice of pizza to 10-year-old Keiko and another slice to 3-year-old Kenny. Kenny's pizza slice was cut into five pieces, so Kenny told his sister that he got more pizza than she did. Kenny did not understand that cutting the pizza into smaller pieces did not increase the overall amount. This was because Kenny exhibited centration when he focused on only one characteristic (the number of pieces) to the exclusion of others (total amount). Kenny's reasoning was based on his five pieces of pizza compared to his sister's one piece even though the total amount of pizza each had was the same. Keiko was able to consider several characteristics of an object than just one. Because children have not developed this understanding of conservation, they cannot perform mental operations.

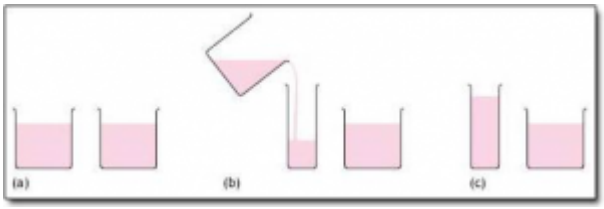

Figure 5.3. Conservation of Liquid. Does pouring liquid in a tall, narrow container make it have more?

The classic Piagetian experiment associated with conservation involves liquid (Crain, 2005). As seen on the left side of Figure 5.3, the child is shown two glasses which are filled to the same level and asked if they have the same amount. Usually the child agrees they have the same amount. The experimenter then pours the liquid in one glass to a taller and thinner glass (as shown in the center of Figure 5.3). The child is again asked if the two glasses have the same amount of liquid. The preoperational child will typically say the taller glass now has more liquid because it is taller (as shown on the right side). The child has centrated on the height of the glass and fails to conserve.

Classification errors. Preoperational children also demonstrate centration when they have difficulty understanding that an object can be classified in more than one way. For example, if shown three white buttons and four black buttons and asked whether there are more black buttons or buttons, the child is likely to respond that there are more black buttons. They focus on the most salient feature (black buttons) and cannot keep in mind the the general class of buttons, so they compare black versus white buttons, instead of part versus whole. Because young children lack these general classes, their reasoning is typically **transductive**, that is, *making faulty inferences from one specific example to another*. For example, Piaget's daughter Lucienne stated she had not had her nap, therefore it was not afternoon. She did not understand that afternoons are a time period and her nap was just one of many events that occurred in the afternoon

(Crain, 2005). As the child's capacity to mentally represent and coordinate multiple features improves, the ability to classify objects emerges.

Critique of Piaget. Similar to the critique of the sensorimotor period, several psychologists have attempted to show that Piaget also underestimated the intellectual capabilities of the preoperational child. For example, children's specific experiences can influence when they are able to conserve. Children of pottery makers in Mexican villages know that reshaping clay does not change the amount of clay at much younger ages than children who do not have similar experiences (Price-Williams, Gordon, & Ramirez, 1969). Crain (2005) also showed that under certain conditions preoperational children can think rationally about mathematical and scientific tasks, and they are not always as egocentric as Piaget implied. Research on theory of mind (discussed later in the chapter) shows that some children overcome egocentrism by 4 or 5 years of age, which is sooner than Piaget indicated. As with sensorimotor development, Piaget seemed to be right about the exact sequence and the processes involved in cognitive development, as well as when these steps are typically observable under naturalistic conditions. But current research has provided more accurate estimates of the exact ages when underlying capacities emerge, which could only be revealed by working with children in specific experimental conditions that removed barriers to their performance.

Vygotsky's Sociocultural Theory: Changes in Thought with Guidance

Figure 5.4. Lev Vygotsky

Modern social learning theories stem from the work of Russian psychologist Lev Vygotsky, who produced his ideas as a reaction to existing conflicting approaches in psychology (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 developmental theories, focusing on qualitative changes in behavior over time, that attempt to explain unseen processes of development in thought, language, and higher-order thinking skills. Although Vygotsky's intent was mainly to understand higher psychological processes in children, his ideas have many 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) the use of psychological tools, particularly language, mediates the 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.

Sociocultural theory. Vygotsky's **sociocultural theory** emphasizes the importance of culture and social 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). For example, young children learn problem-solving skills, not by sitting alone at a desk trying to solve arbitrary problems, but by working alongside parents or older siblings as they work on actual culturally-relevant tasks, like preparing a family meal or repairing a fence. Working together, the dyad or group encounter social or physical problems, and discuss their possible solutions before taking action. Through participation in joint problem-solving, young children develop these skills.

Language as a developmental tool. In his sociocultural view of development, Vygotsky highlighted the tools that the culture provides to support the development of higher order thought. Chief among them is language. For Vygotsky, children interact with the world through the tool of language. For Piaget, children use schemas that they construct and organize on the mental plane, but for Vygotsky, **language,** a social medium, was the mechanism through which we build knowledge of the world. He believed that with development, the language we acquire from our environment shapes the ways in which we think and behave. With development, language becomes internalized as thought (i.e., cognition, or reasoning) and children use this internalized language to guide their action.

Scaffolding and the "Zone of Proximal Development." Vygotsky differed with Piaget in that he believed that a person not only has a set of **actual** 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 can learn cognitive skills within a certain range known as the **zone of proximal development**. Both Piaget and Vygotsky highlighted the importance of interactions with the social and physical world as the sources of developmental change, Piaget's ideas of cognitive development emphasized universal stages progressing toward increasing cognitive complexity. Vygotsky presents a more culturally-embedded view in which situated participatory 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).

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 gave them assistance when they seemed to need it, but once they knew what to do, you stood back and let them go. This is **scaffolding**. This approach to teaching has also been adopted by educators. 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 and mentoring.

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 introduce children to learning activities involving new concepts and problems, but follow their lead, allowing learners to initiate participation when they are ready or interested. 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.

Section Glossary

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.

Sociocultural Theory: Vygotsky's theory that emphasizes how cognitive development proceeds as a result of social interactions between members of a culture, and relies on cultural tools like language.

Zone of Proximal Development: what a learner can do with help from more competent others; sits in the gap between what a learner can do alone without help, and what the learner cannot yet do.

Theory of Mind

Theory of mind refers to *the ability to think about other people's thoughts* (also known as *meta-cognition*—that is, thinking about thinking). Theory of mind is the *understanding that other people experience mental states* (for instance, thoughts, beliefs, feelings, or desires) *that are different from our own*, and that *their mental states are what guide their behavior*. This skill, which emerges in early childhood, helps humans to infer, predict, and understand the reactions of others, thus playing a crucial role in social development and in promoting competent social interactions.

One common method for determining if a child has reached this mental milestone is called the false belief task. The research began with a clever experiment by Wimmer and Perner (1983), who tested whether children can pass a false-belief test (see Figure 5.5). The child is shown a picture story of Sally, who puts her ball in a basket and leaves the room. While Sally is out of the room, Anne comes along and takes the ball from the basket and puts it inside a box. The child is then asked where Sally thinks the ball is located when she comes back to the room. Is she going to look first in the box or in the basket? The right answer is that she will look in the basket, because that is where she put it and thinks it is; but we have to infer this false belief against our own better knowledge that the ball is in the box. This is very difficult for children before the age of four because of the cognitive effort it takes.

Three-year-olds have difficulty distinguishing between what they once thought was true and what they now know to be true. They feel confident that what they know now is what they have always known (Birch & Bloom, 2003). You could say that their perspectives are **fused**: whatever is actually true is what they and everyone else thinks. Even adults need to think through this task (Epley, Morewedge, & Keysar, 2004). To be successful at solving this type of task, the child must separate three things: (1) what is true; (2) what they themselves think (which can be false); and (3) what someone else thinks (which can be different from what they think as well as different from reality). Can you see why this task is so complex?

In Piagetian terms, children must give up a tendency toward egocentrism. The child must also understand that what guides people's actions and responses are what they **believe** rather than what is actually true. In other words, people can mistakenly believe things that are false (called **false beliefs**) and will act based on this false knowledge. Consequently, prior to age four children are rarely successful at solving such tasks (Wellman, Cross & Watson, 2001).

Researchers examining the development of theory of mind have been concerned by the overemphasis on the mastery of false belief as the primary measure of whether a child has attained theory of mind. Two-year-olds understand the diversity of desires, yet as noted earlier it is not until age four or five that children grasp false beliefs, and often not until middle childhood do they understand that people may hide how they really feel. In part, because children's understanding is **fused:** in early childhood children do not differentiate genuine feelings from the expression of feelings. They have difficulty hiding how they really feel (e.g., saying thank you for a gift they do not really like). Wellman and his colleagues (Wellman, Fang, Liu, Zhu & Liu, 2006) suggest that theory of mind is comprised of a number of components, each with its own developmental timeline (see Table 5.1).

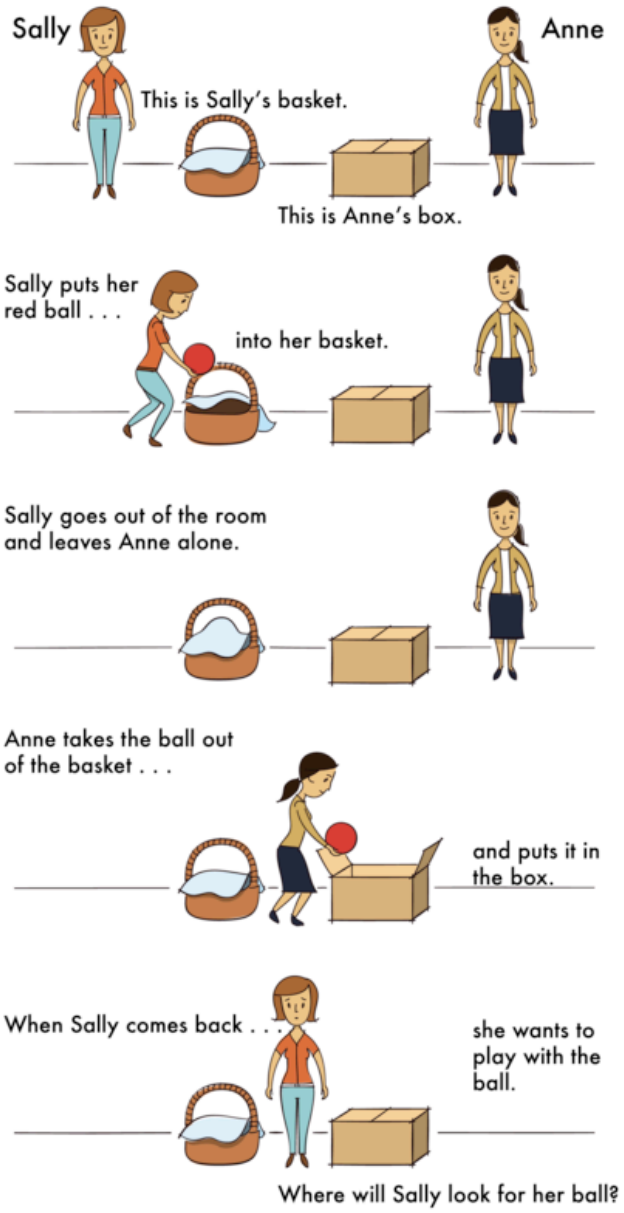

Figure 5.5. Sally–Anne task to test children's ability to infer false beliefs.

Table 5.1 Components of Theory of Mind

***Stage*, Component**	**Description**
Desire Psychology *(ages 2-3)*	
Diverse-desires	Understanding that two people may have different desires regarding the same object.
Belief Psychology *(ages 3 or 4 to 5)*	
Diverse-beliefs	Understanding that two people may hold different beliefs about an object.
Knowledge access (knowledge/ ignorance)	Understanding that people may or may not have access to information.
False belief	Understanding that someone might hold a belief based on false information.

adapted from Lally & Valentine-French, 2019

Those in early childhood in the US, Australia, and Germany develop theory of mind in the sequence outlined in Table 4.2. Yet, Chinese and Iranian preschoolers acquire knowledge access before diverse beliefs (Shahaeian, Peterson, Slaughter & Wellman, 2011). Shahaeian and colleagues suggested that cultural differences in child-rearing may account for this reversal. Parents in collectivistic cultures, such as China and Iran, emphasize conformity to the family and cultural values, greater respect for elders, and the acquisition of knowledge and academic skills more than they do autonomy and social skills (Frank, Plunkett & Otten, 2010). This could reduce the degree of familial conflict of opinions expressed in the family. In contrast, individualistic cultures encourage children to think for themselves and assert their own opinion, and this could increase the risk of conflict in beliefs being expressed by family members. As a result, children in individualistic cultures would acquire insight into the question of diversity of belief earlier, while children in collectivistic cultures would acquire knowledge access earlier in the sequence. The role of conflict in aiding the development of theory of mind may account for the earlier age of onset of an understanding of false belief in children with siblings, especially older siblings (McAlister & Petersen, 2007; Perner, Ruffman & Leekman, 1994).

This awareness of the existence of theory of mind is part of social intelligence, such as recognizing 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 be empathic toward others. Moreover, this "mind reading" ability helps us to anticipate and predict people's actions. The awareness of the mental states of others is important for communication and social skills.

Language Development

The development of symbolic representation during the second year of life leads to an explosion of language growth during toddlerhood and early childhood.

Vocabulary growth. Between the ages of two to six, a child's vocabulary expands 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. at the same time, children learning less verb-friendly languages, such as English, seem to need assistance in grammar to master the use of verbs (Imai et al., 2008).

Literal meanings. 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 may begin asking "Cake? Where is my cake? I want cake!" Or when a young child falls down and scrapes her knee, and she hears a parent say "Oh your poor knee" as they put on a band-aid, the parent should not be surprised if, when the child falls down and scapes an elbow, she shows it to the parent and says– "Oh, man, I got another knee."

Overregularization. Children learn rules of grammar as they learn language but may apply these rules inappropriately at first. For instance, a child learns to add "ed" to the end of a word to indicate past tense. Then forms a sentence such as "I goed there. I doed that." This is typical at ages two and three. Even without any correction, those mistakes will soon disappear, and they will learn new words such as "went" and "did" to be used in those situations.

The impact of training. Remember Vygotsky and the Zone of Proximal Development? Children can be assisted in learning language by others who listen attentively, model more accurate pronunciations and encourage elaboration. The child exclaims, "I'm goed there!" and the adult responds, "You went there? Where did you go?" No corrections are needed. Children may be ripe for language as Chomsky suggests, but active participation in helping them learn

is important for language development as well. The process of scaffolding is one in which the guide provides needed assistance to the child as a new skill is learned.

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 60 million people (21%) speak a language other than English at home (Camarota & Zeigler, 2014; Ryan, 2013). Children who are dual language learners are one of the fastest growing populations in the United States (Hammer et al., 2014). They make up nearly 30% of children enrolled in early childhood programs, like Head Start. By the time they enter school, they are very heterogeneous in their language and literacy skills, with some children showing delays in proficiency in either one or both languages (Hammer et al., 2014). Hoff (2018) reports language competency is dependent on the quantity, quality, and opportunity to use a language. Dual language learners may hear the same number of words and phrases (quantity) overall, as do monolingual children, but it is split between two languages (Hoff, 2018). Thus, in any single language they may be exposed to fewer words. They will show higher expressive and receptive skills in the language they come to hear the most.

In addition, the quality of the languages spoken to the child may differ in bilingual versus monolingual families. Place and Hoff (2016) found that for many immigrant children in the United States, most of the English heard was spoken by a non-native speaker of the language. Finally, many children in bilingual households will sometimes avoid using the family's heritage language in favor of the majority language (DeHouwer, 2007, Hoff, 2018). A common pattern in Spanish-English homes, is for the parents to speak to the child in Spanish, but for the child to respond in English. As a result, children may show little difference in the receptive skills between English and Spanish, but better expressive skills in English (Hoff, 2018).

There are several studies that have documented the **advantages** *of learning more than one language in childhood for cognitive executive function skills.* Bilingual children consistently outperform monolinguals on measures of inhibitory control, such as ignoring irrelevant information (Bialystok, Martin & Viswanathan, 2005). Studies also reveal an advantage for bilingual children on measures of verbal working memory (Kaushanskaya, Gross, & Buac, 2014; Yoo & Kaushanskaya, 2012) and non-verbal working memory (Bialystok, 2011). However, it has been reported that among lower SES populations the working memory advantage is not always found (Bonifacci, Giombini, Beloocchi, & Conteno, 2011).

There is also considerable research to show that being bilingual, either as a child or an adult, leads to greater efficiency in the word learning process. Monolingual children are strongly influenced by the **mutual-exclusivity bias**, *the assumption that an object has only a single name* (Kaushanskaya, Gross, & Buac, 2014). For example, a child who has previously learned the word car, may be confused when this object is referred to as an automobile or sedan. Research shows that monolingual children find it easier to learn the name of a new object, than acquiring a new name for a previously labelled object. In contrast, bilingual children and adults show little difficulty with either task (Kaushanskaya & Marian, 2009). This finding may be explained by the experience bilinguals have in translating between languages when referring to familiar objects.

Educational programs should take advantage of the preschool years as a time when children are developmentally primed to learn more than one language. The practice in the US of waiting until middle or high school to learn a second language flies in the face of the natural developmental progression of language learning. Systematic instruction, practice, reading, and writing in multiple languages would allow young children to become bilingual and bi-literate during a developmental period when that is relatively easy. That is why many school districts offer immersion programs in multiple languages starting in preschool or Kindergarten. School districts who serve many children who speak first languages other than English can take advantage of their skills and support bilingualism in all their pupils.

Early Childhood Education

Providing universal preschool has become an important lobbying point for federal, state, and local leaders throughout our country. In his 2013 State of the Union address, President Obama called upon congress to provide high quality preschool for all children. He continued to support universal preschool in his legislative agenda, and in December 2014 the President convened state and local policymakers for the White House Summit on Early Education (White House Press Secretary, 2014). However, universal preschool covering all four-year olds in the country would require significant funding. Further, how effective preschools are in preparing children for elementary school, and what constitutes high quality preschool have been debated.

To set criteria for designation as a high-quality preschool, the National Association for the Education of Young Children (NAEYC) identifies 10 standards (NAEYC, 2016). These include:

- Positive and caring relationships among all children and adults are promoted.
- The curriculum supports learning and development in social, emotional, physical, language, and cognitive areas.
- Teaching approaches are developmentally, culturally, and linguistically attuned.
- Children's progress is assessed to provide information on their learning and development.
- Children's health and nutrition are promoted, while they are protected from illness and injury.
- Teachers possess the educational qualifications, knowledge, and commitment to promote children's learning.
- Collaborative relationships with families are established and maintained.
- Relationships with agencies and institutions in the children's communities are established to support the program's goals.
- Indoor and outdoor physical environments are safe and well-maintained.
- Leadership and management personnel are well qualified, effective, and maintain licensure status with the applicable state agency.

Parents should review preschool programs using criteria such as those set by NAEYC as a guide and template for asking questions that will assist them in choosing the best program for their child. Selecting the right preschool is also difficult because there are so many types of preschools available. Zachry (2013) identified Montessori, Waldorf, Reggio Emilia, High Scope, Parent Co-Ops and Bank Street as types of preschool programs, approaches, and curricula that focus on children learning through discovery. Teachers act as guides and create activities based on the child's developmental level.

Head Start. For children who live in poverty, Head Start has been providing preschool education since 1965 when it was begun by President Lyndon Johnson as part of his war on poverty. It currently serves nearly one million children and annually costs approximately 7.5 billion dollars (United States Department of Health and Human Services, 2015). However, concerns about the effectiveness of Head Start have been ongoing since the program began. Armor (2015) reviewed existing research on Head Start and found there were no lasting gains, and the average child in Head Start had not learned more than children who did not receive preschool education. One study showed that 3-and 4-year-old children in Head Start received "potentially positive effects" on general reading achievement, but no noticeable effects on math achievement and social-emotional development (Barshay, 2015).

Figure 5.6. Four year old head start students

Nonexperimental designs are a significant problem in determining the effectiveness of Head Start programs because a control group is needed to show group differences that would demonstrate educational benefits. Because of ethical reasons, low income children are usually provided with some type of pre-school programming in an alternative setting. Additionally, Head Start programs are different depending on the location, and these differences include the length of the day or qualification of the teachers. Lastly, testing young children is difficult and strongly dependent on their language skills and comfort level with an evaluator (Barshay, 2015).

Despite the challenges in researching the effectiveness of Head Start, the social and economic **benefits** *of investing in universal preschool cannot be overstated.* This is especially true for preschool programs that **serve disadvantaged children and communities**. Researchers and economists have estimated that investing in the cost of Head Start for a single child—about $17,000—can yield a return to society of between $300,000 and $500,000 over that child's lifetime (Heckman et al., 2010). This substantial economic return (potentially saving our society billions of dollars in the long run) comes in the form of lower high school dropout rates, lower unemployment rates, and lower rates of incarceration—all of which have been documented for individuals who had academic and social supports during early childhood (Heckman et al., 2010). Similar to the concept of preventative healthcare, the benefits of investing in early education for children in poor or underserved communities today will add up over time, and will yield greater societal benefits than we would expect from programs that implement interventions *after* problems emerge (for example, remedial schooling, job re-training, or substance abuse rehabilitation; Heckman, 2006).

Supplemental Materials

- This Ted Talk features a seasoned school teacher, who discusses the importance of building strong and positive relationships with students.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=99#oembed-1

- This Ted Talk given by queer educator, Lindsay Amer, discusses why kids need to learn about gender and sexuality.

> *One or more interactive elements has been excluded from this version of the text. You can view them online here:* https://pdx.pressbooks.pub/humandevelopment/?p=99#oembed-2

- This website offers queer educator, Lindsay Amer's teaching videos and resources to educate kids about gender and sexuality.

  http://queerkidstuff.com/videos

- This study explores maternal involvement in the preschool years for Black families across three generations.

  Jarrett, R. L. & Coba-Rodriguez, S. (2015). "My Mother Didn't Play about Education": Low- income, African American Mothers' Early School Experiences and Their Impact on School Involvement for Preschoolers Transitioning to Kindergarten. *The Journal of Negro Education*, 84 (3), 457-472.

- This article compares Piaget and Vygotsky's perspectives on learning and development in a deep dive on constructivism.

  Vianna, E., & Stetsenko, A. (2006). Embracing History through Transforming It: Contrasting Piagetian versus Vygotskian (Activity) Theories of Learning and Development to Expand Constructivism within a Dialectical View of History. Theory & Psychology, 16(1), 81–108. https://doi.org/10.1177/0959354306060108

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Play and Peers

Learning Objectives: The Role of Play in Development

- Describe Erikson's fourth stage of industry vs. inferiority.
- Define play.
  - Describe the six types of play that emerge over time.
- Define pretend play and describe how it contributes to development.
  - Describe the ways that children benefit from play.
  - Explain how we can promote healthy play.

Developmental Task of Middle Childhood: Industry vs. Inferiority

According to Erikson, children in middle and late childhood are very busy or industrious (Erikson, 1982). 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 peers. Erikson believed that if these industrious children can be successful in their endeavors, they will get a sense of confidence 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 successfully negotiate 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 which 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.

The Role of Play in Development

Figure 6.1

What is Play? Play is spontaneous fun activity found at all ages and in all cultures. Play begins in infancy. Freud analyzed play in terms of emotional development. Vygotsky and Piaget saw play as a way for children to develop their intellectual abilities (Dyer & Moneta, 2006). Piaget called play "a child's work." Subsequent research has shown that play provides many positive outcomes for children in all domains of development. The activity of play provides children opportunities to exercise all their developing capacities: physical, cognitive, emotional, and social. Play is spontaneous; children are intrinsically motivated to play. Play may be done alone or with others. It often involves pretending and make-believe.

Types of Play. In a classic study, Parten (1932) observed two to five-year-old children and noted six types of play: Three labeled as non-social play (unoccupied, solitary, and onlooker) and three categorized as social play (parallel, associative, and cooperative). The following Table describes each type of play. Younger children engage in non-social play more than older children; by age five associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006).

Table 6.1 Parten's Classification of Types of Play in Preschool Children

Category	Description
Unoccupied Play	Children's behavior seems more random and without a specific goal. This is the least common form of play.
Solitary Play	Children play by themselves, do not interact with others, nor are they engaging in similar activities as the children around them.
Onlooker Play	Children are observing other children playing. They may comment on the activities and even make suggestions, but will not directly join the play.
Parallel Play	Children play alongside each other, using similar toys, but do not directly act with each other.
Associative Play	Children will interact with each other and share toys, but are not working toward a common goal.
Cooperative Play	Children are interacting to achieve a common goal. Children may take on different tasks to reach that goal.

adapted from Paris, Ricardo, & Rymond, 2019

Pretend Play. Pretense is a familiar characteristic of play. Pretend play can be combined with physical play or playing with objects. When pretending, children act as-if; they engage in make-believe. Their words and actions are not literal, but evoke something beyond what is concretely present (Lillard, Lerner, Hopkins, Dore, Smith, and Palmquist, 2015). In his study of cognitive development, Piaget was interested in pretend play and he documented the way in which it involved **symbolic thought**, that is, *the ability to have a symbol represent something in the real world*. A toy, for example, has qualities beyond the way it was designed to function, and can be used to stand for a character or a completely different object. A banana can be used as a telephone. As seen in the study of early childhood, symbolic thought is an important capability developed at the end of the sensorimotor stage that paves the way for the development of language. But pretend play uses capabilities that go beyond symbolic thought and mental representation.

Pretend play also requires the use of fantasy and imagination (Sobel & Lillard, 2001). Imagination is distinct from, but jointly engaged during play with executive function, including the developing capabilities of memory, inhibition, and attention shifting (Carlson & White, 2013). A complex form of pretend play emerges in Parten's last two stages, associative play, and cooperative play. This new form is **sociodramatic play**, which is *make-believe play with others*, involving objects and actions woven into some kind of *imagined situation or story*. It is often scaffolded in play with adults or older children. As the development of sociodramatic play progresses, children begin acting out roles. They use situated imaginary identities as the basis of action and to create story lines. Through the creation of settings, roles, and narrative, imagination is used to explore ideas about what follows what, and about how things unfold in the world (Deunk, Berenst, & De Glopper, 2008). Perspective taking is improved through this social form of pretend play. Emotional development also is also fostered by sociodramatic play, as children choose imagined interpretations and responses to imagined emotions in pretend situations, and responds to emotions that arise in actual conflict generated between playmates. Perspective taking and dealing with emotions during pretend play contribute to the development of self-regulation (Gioia & Tobin, 2020).

Figure 6.2

Benefits of Play

"Play in all its rich variety is one of the highest achievements of the human species," says Dr. David Whitebread from Cambridge University's Faculty of Education. "It underpins how we develop as intellectual, problem-solving, emotional adults and is crucial to our success as a highly adaptable species." International bodies like the United Nations and the European Union have begun to develop policies concerned with children's right to play, and to consider implications for leisure facilities and educational programs.

Thanks to the Centre for Research on Play in Education, Development and Learning (PEDaL) at Cambridge, Whitebread, Baker, Gibson and a team of researchers are accumulating evidence on the role played by play in how a child develops. "A strong possibility is that play supports the early development of children's self-control," explains Baker, ". . . our abilities to develop awareness of our own thinking processes." If playful experiences do facilitate this aspect of development, say the researchers, it could be extremely significant for educational practices because the ability to self-regulate has been shown to be a key predictor of academic performance.

Gibson adds: "Playful behaviour is also an important indicator of healthy social and emotional development. In my previous research, I investigated how observing children at play can give us important clues about their well-being and can even be useful in the diagnosis of neurodevelopmental disorders like autism."

Source: Plays the Thing, Cambridge University https://www.cam.ac.uk/research/features/plays-the-thing is licensed under a CC BY 4.0

Sports and Physical Education

Figure 6.3. Sports participation in 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 improve athletically, learn a sense of competition, and build social skills. However, it has been suggested that the emphasis on competition and athletic skill 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. 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 mentors 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 a much higher participation of 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.

Students don't always persist in their participation in extracurricular and other organized sports activities. 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 6.2). According to the Sport 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 6.2 Top Reasons Dropped Out or Stopped Playing Organized/Team Sports

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

Physical Education. For many children, physical education in school is a key component in introducing children to sports and regular physical activity. 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). There is also controversy about physical education. Some experts recommend changing the content of these classes. Training on competitive sports, often a high priority, is unlikely to reach the least physically fit youngsters. Instead, programs could emphasize cooperation, enjoyable informal games, and individual exercise.

Learning Objectives: Friendships and Peer Relationships

- Identify three research traditions that study children's relationships with agemates.
- Describe differences in boys' and girls' friendships.
- Describe benefits of friendship. How do friendships differ from peer relationships?
- Describe sociometric assessment. Identify the categories of sociometric status and describe how children in these categories differ from each other.

Friendship and Peer Relationships

Friendships and peer relationships are *voluntary associations characterized by some degree of simalarity and affiliation.* Three research traditions focus on the study of friendship and peer relationships. First, there is the study of **friendships**, which are *dyadic relationships involving closeness and reciprocity*. Second, another tradition studies groups of affiliated

peers. In adolescence, these include cliques and crowd. Third, a separate tradition researches *agemate status and popularity*, a tradition known as **sociometrics**. Let's look at each of these separately.

Friendship

Figure 6.4

As toddlers, children may begin to show a preference for certain playmates (Ross & Lollis, 1989). However, peer interactions at this age often involve more parallel play rather than intentional social interactions (Pettit, Clawson, Dodge, & Bates, 1996). By age four, many children use the word "friend" when referring to certain children and do so with a fair degree of stability (Hartup, 1983). However, among young children "friendship" is often based on proximity, such as they live next door, attend the same school, or it refers to whomever they happen to be playing with at the time (Rubin, 1980).

Friendships take on new importance to one's feelings of worth, competence, and attractiveness in middle and late childhood. 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 or say, and how to act. This society of children marks a transition from a life focused on the family to a life concerned with peers. During middle and late childhood, peers play an increasingly important role. For example, 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. Children's conceptualization of what makes someone a "friend" changes from a more egocentric understanding to one based on mutual trust and commitment. Both Bigelow (1977) and Selman (1980) believe that these changes are linked to advances in cognitive development.

Bigelow and La Gaipa (1975) outline three stages in children's conceptualizations of friendship. In stage one, **reward-cost**, friendship *focuses on mutual activities*. Children in early, middle, and late childhood all emphasize similar interests as the main characteristics of a good friend. Stage two, **normative expectation** *focuses on conventional morality; that is, the emphasis is on a friend as someone who is kind and shares with you.* Clark and Bittle (1992) found that, compared to third or eighth graders, fifth graders emphasized this more in a friend. In the final stage, **empathy and understanding**, *friends are people who are loyal, committed to the relationship, and share intimate information.* Clark and Bittle (1992) reported eighth graders emphasized this most in a friend. They also found that as early as fifth grade, girls were starting to include sharing of secrets, and not betraying confidences as crucial to someone who is a friend.

Selman (1980) outlines five stages of friendship from early childhood through to adulthood:

- **Momentary physical interaction**, *a friend is someone who you are playing with at this point in time.* Selman notes that this is typical of children between the ages of three and six. These early friendships are based more on circumstances (e.g., a neighbor) than on genuine similarities.
- **One-way assistance**, *a friend is someone who does nice things for you*, such as saving you a seat on the school bus or sharing a toy. However, children in this stage, do not always think about what they are contributing to the relationships. Nonetheless, having a friend is important and children will sometimes put up with a not so nice friend, just to have a friend. Children as young as five and as old as nine may be in this stage.
- **Fair-weather cooperation**, children are very concerned with fairness and reciprocity, and thus, *a friend is someone returns a favor*. In this stage, if a child does something nice for a friend there is an expectation that the friend will do something nice for them at the first available opportunity. When this fails to happen, a child may break off the

friendship. Selman found that some children as young as seven and as old as twelve are in this stage.

- **Intimate and mutual sharing**, typically between the ages of eight and fifteen, *a friend is someone who you can tell them things you would tell no one else.* Children and teens in this stage no longer "keep score" and do things for a friend because they genuinely care for the person. If a friendship dissolves in the stage it is usually due to a violation of trust. However, children in this stage do expect their friend to share similar interests and viewpoints and may take it as a betrayal if a friend likes someone that they do not.
- **Autonomous interdependence**, *a friend is someone who accepts you and that you accept as they are.* In this stage children, teens, and adults accept and even appreciate differences between themselves and their friends. They are also not as possessive, so they are less likely to feel threatened if their friends have other relationships or interests. Children are typically twelve or older in this stage.

Peer Groups

In addition to their friendships, children also interact with other children their own age, referred to as peers. Peers include children encountered at school, in the neighborhood, or through family associations. Not all peers are friends. Some are acquaintances, and others are non-affiliated, but still part of the social context. Collections of peers that hang out or repeatedly engage in joint activities are referred to as peer groups, or cliques.

Sociometrics and Popularity

Sociometric assessment *measures social status and acceptance among members of a group*, such as a classroom of students. In sociometric research children are asked to mention the three children they like to play with the most, and those they do not like to play with. The number of times a child is nominated for each of the two categories (like, do not like) is tabulated. **Popular children** *receive many votes in the "like" category, and very few in the "do not like" category.* In contrast, **rejected children** *receive more unfavorable votes, and few favorable ones.* **Controversial children** *are mentioned frequently in each category*, with several children liking them and several children placing them in the "do not like" category. **Neglected children** *are rarely mentioned in either category*, and the **average child** *has a few positive votes with very few negative ones* (Asher & Hymel, 1981).

Figure 6.5

Most children want to be liked and accepted by their friends. Some popular children are nice and have good social skills. These **popular-prosocial** children *tend to do well in school and are cooperative and friendly.* **Popular-antisocial** children may *gain popularity by acting tough or spreading rumors about others* (Cillessen & Mayeux, 2004). Rejected children are sometimes excluded because they are **rejected-withdrawn**. *These children are shy and withdrawn* and are easy targets for bullies because they are unlikely to retaliate when belittled (Boulton, 1999). Other rejected children are **rejected-aggressive** and *are ostracized because they are aggressive, loud, and confrontational.* The aggressive-rejected children may be acting out of a feeling of insecurity. Unfortunately, their fear of rejection only leads to behavior that brings further rejection from other children. Children who are not accepted are more likely to experience conflict, lack confidence, and have trouble adjusting (Klima & Repetti, 2008; Schwartz, Lansford, Dodge, Pettit, & Bates, 2014).

Long-Term Consequences of Popularity. Childhood popularity researcher Mitch Prinstein has found that likability in childhood leads to positive outcomes throughout one's life (as cited in Reid, 2017). Adults who were accepted in childhood have stronger marriages and work relationships, earn more money, and have better health outcomes than those who were unpopular. Further, those who were unpopular as children, experienced greater anxiety, depression,

substance use, obesity, physical health problems and suicide. Prinstein found that a significant consequence of unpopularity was that children were denied opportunities to build their social skills and negotiate complex interactions, thus contributing to their continued unpopularity. Further, biological effects can occur due to unpopularity, as social rejection can activate genes that lead to an inflammatory response.

Supplemental Materials

- This video gives a brief history and significance of jump rope, particularly for Black girls in the U.S.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=101#oembed-1

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Cognitive Development

Learning Objectives: Cognitive Development during Middle Childhood

- Name three major advances in cognitive development that occur with the shift to concrete operational thinking.
- What do these developments allow that thinking during the preoperational stage did not?
- Provide some examples of how concrete operational thought is seen in children's everyday functioning during middle childhood.
- What are the limitations of concrete operational thought?

Recall from the last chapter that during early childhood children are in Piaget's **preoperational stage**, and during this stage, children are learning to think symbolically about the world. As children continue into elementary school, they develop the ability 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.

Concrete Operational Thought

From ages 7 to 11, children are in what Piaget referred to as the **concrete operational stage** of cognitive development (Crain, 2005). *This involves mastering the use of logic in concrete ways.* The word concrete refers to that which is tangible; that which can be seen, 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 principles of cause and effect, size, and distance.

The child can use logic to solve problems tied to their own direct experience, but has trouble solving hypothetical problems or considering more abstract problems. The child uses **inductive reasoning,** *which is a logical process in which multiple premises believed to be true are combined to obtain a specific conclusion.* For example, a child has one friend who is rude, another friend who is also rude, and the same is true for a third friend. The child may conclude that friends are rude. We will see that this way of thinking tends to change during adolescence as deductive reasoning emerges. We will now explore three of the major capacities that the concrete operational child exhibits.

Thought becomes multidimensional. Concrete operational children *no longer focus on only one dimension of any object (such as the height of the glass) and instead can coordinate multiple dimensions simultaneously (such as the width of the glass).* (That is, they are no longer limited by centration, which is why this gain is also known by the term

"decentration"). Multidimensionality allows children to take multiple perspectives at the same time, to understand part-while relationships, and to cross classify objects using multiple features.

Figure 6.13. Children looking at these glasses demonstrate multidimensional thinking when looking at more than one attribute i.e. tall, short, and wide narrow.

- **Multiple perspectives.** Remember our discussion of pre-operational thought– when young children were asked to describe the Three Mountain display from the perspective of someone sitting across the table form them? They could only report on the view form one perspective– their own. With the emergence of connote operations, children can now understand that people looking from different vantage points, see different features. They can coordinate multiple perspectives. This skill is very useful, and can be practiced, while playing with peers and settling peer disputes.
- **Part-whole relationships.** Think back to preoperational thought, where if you showing a long child a bouquet of six daisies and 3 roses, and asked them whether there were more daisies or flowers, they would typically answer"daisies"? They could not coordinate the two perspectives of "part" and "whole." Now in middle childhood, these questions seem silly– of course there are more flowers, flowers include both daisies *and* roses. At the age, the correct answer is obvious– it's a logical necessity.
- **Classification.** As children's experiences and vocabularies grow, *they build schemata and are able to organize objects in many different ways*. They also understand classification hierarchies and can arrange objects into a variety of classes and subclasses.

Figure 6.7. This child might use classification if she sorts these toys by color.

Thought becomes operational. A second major shift in cognitive development during middle childhood coccus when thought becomes **operational**, by which Piaget meant that it consists of *reversible, organized systems of mental actions.* These systems allow children to mentally undo actions (**reversibility**) and to understand that certain properties of objects (like their number, mass, volume, and so on) remain constant despite transformations in appearance (**conservation**).

Figure 6.11. Understanding that ice cubes melt is an example of reversibility.

- **Reversibility.** *The child learns that some things that have been changed can be returned to their original state.* 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.
- **Conservation.** Remember the example in our last chapter of preoperational children thinking that a tall beaker filled with 8 ounces of water was "more" than a short, wide bowl filled with 8 ounces of water? Concrete operational children can understand the concept of conservation *which means that changing one quality (in this example, height or water level) can be compensated for by changes in another quality (width).* Consequently, there is the same amount of water in each container, although one is taller and narrower and the other is shorter and wider.

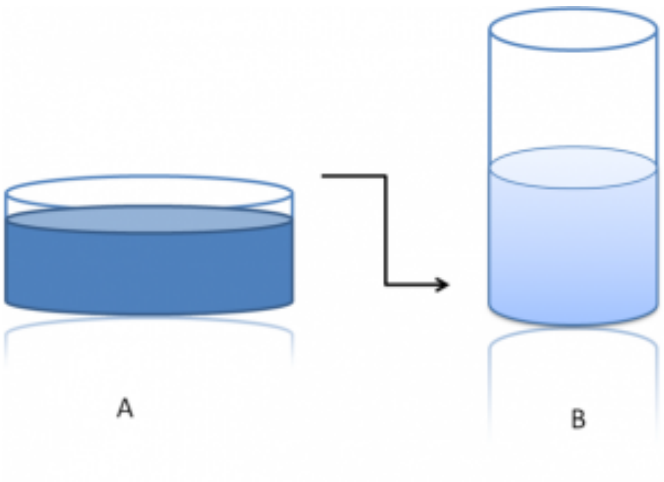

Figure 6.12. Beakers displaying the idea of conservation.

Thought becomes logical. A third major accomplishment of concrete operational development is that thought becomes **logical**, and children *can reason logically about concrete events.*

- **Inferring higher-order characteristics.** Where young children's reasoning was focused on perceptual cues, older children can now consider a variety of specific cues and from, use the power of inference, to reach a logical conclusion about higher-order characteristics. This capacity is seen in children's understanding of their own and other people's capacities and personalities. For example, after a child does well on multiple multiple assignments in math, she may conclude that she is high in math ability.
- **Identify defining features.** Whereas young children's understanding was dominated by the most perceptually salient features of objects, with concrete operational thought, children in middle childhood *focus instead on the defining features of particular objects or states.* They are not distracted by the most salient features; they recognize the underlying **defining** features. For example, young children might think that bicycles and toasters are alive (a kind of thought called "animism," remember?) because they move. By middle childhood, however, children understand that even though many mechanical devices (e.g., cars, fireworks) and natural objects move (e.g., the sun, the tides), only plants and animals have a life force, which is the defining feature of being alive.
- **Seriation.** *Arranging items along a quantitative dimension, such as length or weight, in a methodical way* is now demonstrated by the concrete operational child. For example, they can methodically arrange a series of different-sized sticks in order by length. This is a complicated task that requites multidimensional thinking, because each object must be placed so that it is bigger than the one before it, but smaller than the one after it. These capacities allow children to make social comparisons as well, estimating who is bigger or better along some attribute or capacity (e.g., spelling ability, soccer skills, drawing). Social comparison plays a role in the shift in children's estimates of their capacities; they change from the rosy overestimates of early childhood (where everyone sees themselves as "good" at everything regardless of performance) to a more accurate view that corresponds to external referents (e.g., school grades) during middle childhood.

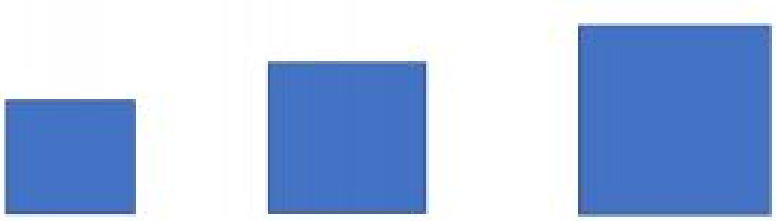

Figure 6.14. Putting these squares from smallest to largest is an example of seriation.

- **Transitive inference.** Being able to understand how objects are related to one another is referred to as transitivity, or transitive inference. This means that if one understands that a dog is a mammal, and that a poodle is a dog, then a poodle must be a mammal.

Figure 6.15. Transitivity allows children to understand that this poodle is a dog and a mammal

Limitations of concrete operational thought. These new cognitive skills increase the child's understanding of the physical world, however according to Piaget, they still cannot think in abstract ways. Additionally, they do not think in systematic scientific ways. For example, when asked which variables influence the period that a pendulum takes to complete its arc and given weights they can attach to strings in order to do experiments, most children younger than 12 perform biased experiments from which no conclusions can be drawn (Inhelder & Piaget, 1958).

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Moral Development

Learning Objectives: Development of Moral Reasoning

- According to Kohlberg's theory, what are the three stages of moral reasoning?
  - How do these stages correspond to Piaget's stages of cognitive development?
  - What are the substages within each one and how do they differ?
- What factors influence the development of moral reasoning?
- What are the primary critiques of Kohlberg's theory?
- Do you think that the development of a strong moral compass can provide a foundation for future collective action on behalf of social justice?

Kohlberg's Stages of Moral Development

Kohlberg (1963) built on the work of Piaget and was interested in finding out how our moral reasoning changes as we get older. He wanted to find out how people decide what is right and what is wrong. Just as Piaget believed that children's cognitive development follows specific age-graded stages, Kohlberg (1984) argued that we learn our moral values through active thinking and reasoning, and that moral development follows a series of qualitatively different stages. Kohlberg's six stages are generally organized into three levels of moral reasons. To study moral development, Kohlberg posed moral dilemmas to children, teenagers, and adults, such as the following:

> *A man's wife is dying of cancer and there is only one drug that can save her. The only place to get the drug is at the store of a pharmacist who is known to overcharge people for drugs. The man can only pay $1,000, but the pharmacist wants $2,000, and refuses to sell it to him for less, or to let him pay later. Desperate, the man later breaks into the pharmacy and steals the medicine. Should he have done that? Was it right or wrong? Why? (Kohlberg, 1984)*

Level 1. Preconventional Morality. Reasoning during Level one, which is broken into two stages, is based on what would happen to the man as a result of the act, that is, on the *consequences* of the act. In Stage 1, moral reasoning is based on *concepts of punishment*. The child believes that if the consequence for an action is punishment, then the action was wrong. For example, they might say the man should not break into the pharmacy because the pharmacist might find him and beat him. In Stage 2, the child bases his or her thinking *on self-interest and reward*. "You scratch my back, I'll scratch yours." They might say that the man should break in and steal the drug and his wife will give him a big kiss. Right or wrong, both decisions were based on what would physically happen to the man as a result of the act. This is a self-centered approach to moral decision-making. He called this most superficial understanding of right and wrong **preconventional morality.** *Preconventional morality focuses on self-interest. Punishment is avoided, and rewards are sought.* Adults can also fall into these stages, particularly when they are under pressure.

Level 2. Conventional Morality. Those tested who based their answers on *authority*, that is, based on what other people would think of the man as a result of his act, were placed in Level Two. For instance, they might say he should break into the store, and then everyone would think he was a good husband, or he should not because it is against the law. In

either case, right and wrong is determined by what other people think. In Stage 3, the person reasons based on *mutual expectations and relationships*. They want to please others. At Stage 4, the person acknowledges the importance of *social norms or laws* and wants to be a good member of the group or society. A good decision is one that gains the approval of others or one that complies with the law. This he called **conventional morality**, *people care about the effect of their actions on others*. Some older children, adolescents, and adults use this reasoning.

Level 3. Postconventional Morality. Right and wrong are based on social contracts established for the good of everyone and that can transcend the self and social convention. For example, the man should break into the store because, even if it is against the law, the wife needs the drug and her life is more important than the consequences the man might face for breaking the law. Alternatively, the man should not violate the principle of the right of property because this rule is essential for social order. In either case, the person's judgment goes beyond what happens to the self. It is based on a concern for others; for society as a whole, or for an ethical standard rather than a legal standard. This level is called **postconventional moral development** *because it goes beyond convention or what other people think to a higher, universal ethical principle of conduct that may or may not be reflected in the law.* Notice that such thinking is the kind Supreme Court justices do all day when deliberating whether a law is moral or ethical, which requires being able to think abstractly. Often this is not accomplished until a person reaches adolescence or adulthood. In the Stage 5, laws are recognized as social contracts. The reasons for the laws, like justice, equality, and dignity, are used to evaluate decisions and interpret laws. In the Stage 6, individually determined universal ethical principles are weighed to make moral decisions. Kohlberg said that few people ever reach this stage. The six stages can be reviewed in Table 6.3.

Table 6.3: Lawrence Kohlberg's Levels of Moral Reasoning

Moral Level	Age	Description
Preconventional morality	Young children-usually prior to age 9	Stage 1: Focus is on self-interest and punishment is avoided. The man shouldn't steal the drug, as he may get caught and go to jail. Stage 2: Rewards are sought. A person at this level will argue that the man should steal the drug because he does not want to lose his wife who takes care of him.
Conventional morality	Older children, adolescents, and most adults	Stage 3: Focus is on how situational outcomes impact others and wanting to please and be accepted. The man should steal the drug because that is what good husbands do. Stage 4: People make decisions based on laws or formalized rules. The man should obey the law because stealing is a crime.
Postconventional morality	Rare with adolescents and few adults	Stage 5: Individuals employ abstract reasoning to justify behaviors. The man should steal the drug because laws can be unjust, and you have to consider the whole situation. Stage 6: Moral behavior is based on self-chosen ethical principles. The man should steal the drug because life is more important than property.

Adapted from Lally & Valentine-French, 2019.

Influences on Moral Development

What influences moral development? Kohlberg argued that moral development was not an automatic, maturational process, nor was it mechanistic, in that moral development couldn't simply be taught (Crain, 1985). Instead, he proposed that it develops through repeated practice in situations where children must think together with adults or peers about moral problems: where their viewpoints are challenged or questioned; where they have to consider others' perspectives and perhaps revise their own; and where they must try to coordinate their own desires and those of others with the help of moral rules. Moreover, it is our *active engagement* with these thought processes that helps our development (Berkowitz & Gibbs, 1983). This engagement can occur in many contexts; three notable ones are our caregivers, our schooling, and our peers (Berk, 2014, p. 326).

Studies suggest that caregivers' use of an authoritative parenting style helps children reach higher stages of moral reasoning (Pratt, Skoe, & Arnold, 2010). This style emphasizes care, consistent and fair expectations, and support for autonomy in ways such as discussing the reasoning for rules and encouraging children's own perspectives. These aspects of parenting can help children practice their own moral reasoning, allow them to internalize true moral principles, and over time to act on them under conditions of greater difficulty (aka temptation). On the other hand, use of threats and lectures do not help moral reasoning (Walker & Taylor, 1991). Studies suggest that children remember the negative affect and exertion of force, which interferes with the internalization of moral principles

Education is another important venue for practicing moral reasoning. In general, the more years individuals dedicate to schooling, the higher their average level of moral reasoning (Dawson, 2002). In particular, schools help promote moral reasoning when they offer students exposure to diverse experiences and ways of being, role-taking and perspective-taking opportunities, and chances to discuss and defend their own viewpoints (Comunian & Gielen, 2006; Mason & Gibbs, 1993).

Within schools and outside of them, peers are important relational partners for developing moral reasoning. As opposed to conversations with parents or teachers, which are hierarchical, peers are on more-equal footing. With peers, individuals need to practice communicating their own needs and considering the needs of their friends to reach decisions and resolve conflicts (Killen & Nucci, 1995).

Critiques. Although research has supported Kohlberg's idea that moral reasoning changes from an early emphasis on punishment and social rules and regulations to an emphasis on more general ethical principles, as with Piaget's approach, Kohlberg's stage model is probably too simple. For one, people may use higher levels of reasoning for some types of problems but revert to lower levels in situations where doing so is more consistent with their goals or beliefs (Rest, 1979). Second, it has been argued that the stage model is particularly appropriate for Western, rather than non-Western, samples in which allegiance to social norms, such as respect for authority, may be particularly important (Haidt, 2001). In addition, there is frequently little correlation between how we score on the moral stages and how we behave in real life.

Perhaps the most important critique of Kohlberg's theory is that it emphasizes justice without incorporating compassion and other moral considerations, and in doing so might describe the moral development of males better than it describes that of females (who were not represented in Kohlberg's initial research). Gilligan (1982) has argued that, because of differences in their socialization, males tend to value principles of justice and rights, whereas females value caring for and helping others. She argued for an "ethic of care," emphasizing our human responsibilities to one another and consideration for others. Although there is little evidence for a gender difference in Kohlberg's stages of moral development (Turiel, 1998), there is some evidence that girls and women tend to focus more on issues of caring, helping, and connecting with others than do boys and men (Jaffee & Hyde, 2000). Despite these trends in the relative priorities of caring and justice, evidence suggests that people of **all** genders consider **both justice and caring** to some extent in their moral decisions (Berk, 2014; Walker, 1995).

Development of an internal moral compass as a prerequisite for social activism. Researchers have become increasingly interested in the childhood antecedents of adolescent and adult action on behalf of social and racial justice (Killen, Rutland, & Yip, 2016). These are complex cognitive, social, and motivational processes, that likely are shaped by a host of specific experiences, such as family participation in civil engagement activities (e.g., volunteering and protest movements). However, an important prerequisite would include the development of a strong moral compass during early and middle childhood. Internalization of moral principles of honesty, fairness, and accountability would be useful for helping adolescents and young adults recognize inequities and feel morally responsible for doing their part to see justice done. This will be an interesting area for further study (Killen et al., 2016).

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Gender Development

Learning Objectives: Gender Development

- What is the overall developmental task of constructing a "gender identity"?
    - What is the difference between "sex" and "gender"?
- Be able to define multiple facets of a society's "gender curriculum," including gender roles and gender stereotyping.
- What is "psychological androgyny" and how is it connected to adjustment, flexibility, and well-being?
- Summarize four major theories explaining gender development, namely, social learning theory, neurophysiological bases, cognitive developmental theory, and gender schema theory.
    - What meta-theory underlies each theory?
    - How does a dynamic systems approach incorporate all four of these theories?
- What are the six major age-graded milestones in gender development?
- Name the six areas in which gender differences in psychological functioning have typically been found. How big are these differences?

The task of gender development is a complex biopsychosocial process that takes place in concert with societal stereotypes and the local social contexts they shape. The empirical picture is not complete, but it seems that **gender identities** are *complex internalized cognitive and emotional representations* that children and youth construct for themselves over time, based on the biological and temperamental givens that each one comes with and their cumulative interactions with the social worlds of family, school, peers, and society. Much of gender development seems to reflect *cognitive* changes that allow children to successively realize and try to make sense of different aspects of gender identity, but the whole kit-n-caboodle seems to be built on a foundation created by biological or neurophysiological givens. We will trace the main age-graded milestones that children experience in constructing their own gender identities, in order to suggest ways in which parents (and other adults) can support children's and adolescents' healthy development.

Gender development is a fascinating process because it is deeply rooted in biology, profoundly shaped by societal expectations, and actively constructed by individuals over and over again at different developmental levels. All theories of gender identity posit that the processes shaping its development are both biological and societal, so it is important to get straight on those biological and social processes before we turn to development. This is also a fascinating historical moment to study gender development because science is revealing more and more about its biological and psychological complexity, just as society is undergoing a gender revolution in which people are questioning, exploring, and recognizing a much broader spectrum of gender and sexual identities.

Biopsychosocial Processes of Gender

The terms sex and gender are often used interchangeably, although they have different meanings. In this context, **sex** refers to *biological categories (traditionally, either male or female) as defined by physical differences in genetic composition and in reproductive anatomy and function*. On the other hand, **gender** refers to the *cultural, social, and psychological meanings that are associated with particular biopsychosocial categories*, like masculinity and femininity (Wood & Eagly, 2002), which vary depending on other intersectional factors, like race, ethnicity, and culture.

Historically, the terms gender and sex have been used interchangeably. Because of this, gender is often viewed as a binary – a person is either male *or* female – and it is assumed that a person's gender matches their biological sex. However, recent research challenges both of those assumptions. Although most people identify with the gender that matches their natal sex (cisgender), some of the population (estimates range from 0.6 to 3 percent) identify with a gender that does not match the sex they were assigned at birth (transgender; Flores, Herman, Gates, & Brown, 2016; see box). For example, an individual assigned as male based on biological characteristics may identify as female, or vice versa. Researchers have also been increasingly examining the long-held assumption that biological sex is binary (e.g., Carothers & Reis, 2013; Hyde, Bigler, Joel, Tate, & van Anders, 2019). Although it has always been clear that there are more than two biological sexes, for example individuals who are intersex (see box), more recently scientists have identified dozens of markers of sexuality outside of the reproductive system (e.g., genetic, epigenetic, hormonal, endocrine, neurophysiological, psychological, social). People have a range of different combinations of these characteristics, suggesting that biological sex is more complex and multifaceted than a binary category.

Beyond the Binary in Biological Sex

Some individuals are **intersex** or **sex diverse**; *that is born with either an absence or some combination of male and female reproductive organs, sex hormones, or sex chromosomes* (Jarne & Auld, 2006). In humans, intersex individuals make up a small but significant proportion of world's population; with recent estimates ranging between .05 and 2 percent (Blackless et al., 2000). There are dozens of intersex conditions, and intersex individuals demonstrate some of the diverse variations of biological sex. Some examples of intersex conditions include:

- **Turner syndrome** or *the absence of, or an imperfect, second* X *chromosome*
- **Congenital adrenal hyperplasia** *or a genetic disorder caused by an increased production of androgens*
- **Androgen insensitivity syndrome** or when *a person has one* X *and one* Y *chromosome, but is resistant to the male hormones or androgens*

Greater attention to the rights of children born intersex is occurring in the medical field, and intersex children and their parents should work closely with specialists to ensure these children develop positive gender identities.

Research has also begun to conceptualize gender in ways beyond the gender binary. Genderqueer or gender nonbinary are umbrella terms used to describe a wide range of individuals who do not identify with and/or conform to the gender binary. These terms encompass a variety of more specific terms that individuals may use to describe themselves. Some common terms are genderfluid, agender, and bigender. An individual who is genderfluid may identify as male, female, both, or neither at different times and in different circumstances. An individual who is agender may have no gender or describe themselves as having a neutral gender, while bigender individuals identify as two genders.

It is important to remember that sex and gender do not always match and that gender is not always binary; however, a large majority of prior research examining gender has not made these distinctions. As such, many of the following

sections will discuss gender as a binary. Throughout, we will consider the development of "gender-nonconforming" children. This is a broad and heterogeneous group of children and adults whose gender development does not fit within societal dictates. Because societal expectations are so narrow, there are many ways not to conform, and we mention a few here, just to give a flavor of these alternative pathways. All of them are healthy and positive, but children and adolescents who follow these pathways need social validation and protection from gender discrimination and bullying. Activists are leading global movements that will push society to reinvent its views of the wide variety of sexualities and gender identities that have always been with us.

Transgender Children

Many young children do not conform to the gender roles modeled by the culture and push back against assigned roles. However, a small percentage of children actively reject the toys, clothing, and anatomy of their assigned sex and state they prefer the toys, clothing, and anatomy of the opposite sex. A recent study suggests that approximately three percent of youth identify as **transgender** *or identifying with a gender different from their natal sex* (Rider, McMorris, Gower, Coleman, & Eisenberg, 2018). Many transgender adults report that they identified with the opposite gender as soon as they began talking (Russo, 2016). Some of these children may experience **gender dysphoria**, or *distress accompanying a mismatch between one's gender identity and biological sex* (APA, 2013), while other children do not experience discomfort regarding their gender identity.

As they grow up, some transgender individuals alter their bodies through medical interventions, such as surgery and hormonal therapy, so that their physical being is better aligned with their gender identity. However, not all transgender individuals choose to alter their bodies or physically transition. Many maintain their original anatomy but present themselves to society as a different gender, often by adopting the dress, hairstyle, mannerisms, or other characteristics typically assigned to a certain gender. It is important to note that people who cross-dress, or wear clothing that is traditionally assigned to the opposite gender, such as transvestites, drag kings, and drag queens, do not necessarily identify as transgender (although some do). People often confuse the term **transvestite**, which is the *practice of dressing and acting in a style or manner traditionally associated with another sex* (APA, 2013) with transgender. Cross-dressing is typically a form of self-expression, entertainment, or personal style, and not necessarily an expression of one's gender identity.

Sexual Orientation

A person's **sexual orientation** *is their emotional and sexual attraction to a particular gender.* It is a personal quality that inclines people to feel romantic or sexual attraction (or a combination of these) to persons of a given sex or gender. According to the American Psychological Association (APA) (2016), sexual orientation also refers to a person's sense of identity based on those attractions, related behaviors, and membership in a community of others who share those attractions. Sexual orientation is independent of gender; for example, a transgender person may identify as heterosexual, homosexual, bisexual, pansexual, polysexual, asexual, or any other kind of sexuality, just like a cisgender person.

Sexual Orientation on a Continuum. Sexuality researcher Alfred Kinsey was among the first to conceptualize sexuality as a continuum rather than a strict dichotomy of gay or straight. To classify this

continuum of heterosexuality and homosexuality, Kinsey et al. (1948) created a seven-point rating scale that ranged from exclusively heterosexual to exclusively homosexual. Research conducted over several decades has supported this idea that sexual orientation ranges along a continuum, from exclusive attraction to the opposite sex/gender to exclusive attraction to the same sex/gender (Carroll, 2016).

However, sexual orientation can be defined in many ways. **Heterosexuality**, which is often referred to as being straight, *is attraction to individuals of the opposite sex/gender*, while **homosexuality**, being gay or lesbian, *is attraction to individuals of one's own sex/gender.* **Bisexuality** *was a term traditionally used to refer to attraction to individuals of either male or female sex, but it has recently been used in nonbinary models of sex and gender* (i.e., models that do not assume there are only two sexes or two genders) to refer to attraction to *any* sex or gender. Alternative terms such as **pansexuality** and **polysexuality** have also been developed, *referring to attraction to all sexes/genders and attraction to multiple sexes/genders, respectively* (Carroll, 2016).

Asexuality *refers to having no sexual attraction to any sex/gender*. According to Bogaert (2015) about one percent of the population is asexual. Being asexual is not due to any physical problems, and the lack of interest in sex does not necessarily cause the individual any distress. Asexuality is being researched as a distinct sexual orientation.

Societal Expectations about Gender: Gender Roles and Stereotypes

Children develop within cultures that have a "gender curriculum" that prescribes what it means to be male and female. These include gender roles and gender stereotypes. **Gender roles are** *the expectations associated with being male or female*. Children learn at a young age that there are distinct behaviors and activities deemed to be appropriate for boys and for girls. These roles are acquired through socialization, a process through which children learn to behave in a particular way as dictated by societal values, beliefs, and attitudes. ***Gender stereotyping*** goes one step further: it involves *overgeneralizing about the attitudes, traits, or behavior patterns of women or men*. For boys and men, expectations and stereotypes include characteristics like "tough" or "brave" or "assertive", and for girls and women characteristics like "nice" and "nurturing" and "affectionate." You might be saying to yourself, "but I can be most of those things, sometimes"—and you are right. People of all genders frequently enact roles that are stereotypically assigned to only men or women.

Psychological androgyny. One area of research on gender expectations has examined differences between people who identify with typically masculine or feminine gender roles. Researchers gave men and women lists of positive masculine traits (emphasizing agency and assertiveness) and feminine traits (emphasizing gentleness, compassion, and awareness of others' feelings), and asked them to rate the extent to which those traits applied to them. Some people reported identifying highly with mostly masculine traits or identifying highly with mostly feminine traits, but some people did not identify strongly with either (this group was called "undifferentiated"), and a final group identified strongly with *both* masculine and feminine traits; this last group was called "androgynous" (Bem, 1977). **Psychological androgyny** is when *people display both traditionally male and female gender role characteristics* – people who are both strong and emotionally expressive, both caring and confident.

Which group reported the best psychological functioning? On the one hand, those with more "masculine" traits (the masculine and androgynous groups) tend to have higher self-esteem and lower internalizing symptoms (Boldizar, 1991; DiDonato & Berenbaum 2011). (This may be because "masculine" traits like being self-reliant, self-assured, and assertive are closely related to these outcomes.) On the other hand, there is a cost to missing out on "feminine" traits as well, since things like relationships, emotions, and communication are central to human well-being. In general, studies find

that psychologically androgynous people, who report high levels of *both* male and female characteristics are more adaptable and flexible (Huyck, 1996; Taylor & Hall, 1982), and seem to fare better in general, when considering many areas of adjustment (compared to those with masculine or feminine traits alone; Pauletti, et al. 2017). It may be no surprise that, in general, it is most adaptive to be able to draw on the whole spectrum of human traits (Berk, 2014).

Processes of Gender Development

Four major psychological theories highlight multiple explanatory processes through which children develop gender identities. Most of these theories focus on***gender typing***, which depicts the *processes through which children become aware of their gender*, and *adopt the values, attributes, objects, and activities of members of the gender they identify as their own.*

1. A primary perspective on gender development is provided by **social learning theory**. Consistent with mechanistic meta-theories, this theory *argues that behavior is learned through observation, modeling, reinforcement, and punishment* (Bandura, 1997). Each society has its own "gender curriculum," which leads to differential expectations and treatment starting at birth. Children are rewarded and reinforced for behaving in concordance with gender roles and punished for breaking gender roles. Social learning theory also posits that children learn many of their gender roles by observing and modeling the behavior of older children and adults, and in doing so, learn the behaviors that are appropriate for each gender. In this process, fathers seem to play a particularly important role.
2. A second perspective, consistent with maturational meta-theories, focuses on **biological and neurophysiological factors** that are present at birth. This theory underscores the idea, present in research on gender expression, sexual orientation, and gender identity, that children come with a firm biological foundation for their gender and sexual preferences; these include genes, chromosomes, and hormones (Roselli, 2018). Like temperament, infants seem to come with "gender stuff" that, depending how well it matches current social categories, can influence how they respond to expectations and pressures for conformity.
3. A third perspective, consistent with organismic meta-theories, focuses on **cognitive developmental theory.** This approach holds that children's understanding about gender and its meaning depend completely on their current stage of cognitive development. At birth, children have no idea that gender as a category even exists or that they may belong to one of them. As their developmental capacities grow, toddlers and then young children can successively represent and understand more and more complex aspects of gender-related identity. These cognitive stages provide some of the clearest age-graded milestones in the development of gender identity, such as the emergence of gender **awareness** (i.e., *the recognition of one's own gender*) and gender **constancy** (i.e., *the belief that gender is a fixed characteristic*), which are described in more detail below.
4. A fourth major theory, which emphasizes the active role of the child in constructing a gender identity, is called **gender schema theory**. Consistent with contextualist meta-theories, gender schema theory argues that children are active learners who essentially socialize themselves. In this case, *children actively organize the behavior, activities, and attributes they observe into gender categories, which are known as schemas.* These schemas then affect what children notice and remember later. People of all ages are more likely to remember schema-consistent behaviors and attributes than those that are schema-inconsistent. So, when they think of firefighters, people are more likely to remember men, and forget women. They also misremember schema-inconsistent information. If research participants are shown pictures of someone standing at the stove, they are more likely to remember the person to be cooking if depicted as a woman, and the person to be repairing the stove if depicted as a man. By remembering only schema-consistent information, gender schemas are strengthened over time.

All four processes highlighted in these theories play a role in gender development, which can be considered a biopsychosocial process: (1) as depicted by social learning theory, it is shaped by the society's gender curriculum, through processes of observation, modeling, reinforcement, and punishment; (2) as depicted by biological theories, it is built on a strong neurophysiological foundation of preferences in gender expression, sexual orientation, and gender

identity; (3) as explained by cognitive developmental theory, children's understanding of gender shifts regularly as the complexity of their cognition grows; and (4) as explained by gender schema theory, a child's gender identity is a work in progress, actively constructed through their own efforts and engagement with their social worlds.

Most recently, researchers have drawn on broader more integrative **dynamic systems approaches** to understand the development of gender identity (e.g., Fausto-Sterling, 2012; Martin & Ruble, 2010). These approaches attempt to explain how *complex patterns of gender-related thought, behavior, and experience undergo qualitative shifts*, including disruption, transformation, and reorganization, during different developmental windows. Researchers argue that "children's ongoing physical interactions and psychological experiences with parents, peers, and culture fundamentally shape and reshape their experience of gender developmentally, as different brain and body systems couple and uncouple over time… In the end, gender is not a stable achievement, but rather 'a pattern in time' (Fausto-Sterling, 2012, p. 405) continually building on prior dynamics and adapting to current environments" (Diamond, p. 113).

Age-graded Milestones in Gender Development

1. Intrinsic gender and temperament. Research seems to suggest that newborns come with a neurophysiological package of "gender stuff" that provides an internal anchor for their preferences—including (at least) gender identity and sexual orientation, and perhaps temperamental characteristics, such as activity level, aggression, effortful control, and emotional reactivity. These internal anchors and expressive preferences seem to be part of an individual's *core identity*. Scientists are not exactly sure what determines these intrinsic anchors; so far evidence suggests both genetic influences (e.g., as seen in twin studies, which find that sexual orientation and sexual non-conformity run in families; Van Beijsterveldt, Hudziak, & Boomsma, 2006) and the influence of the prenatal environment (e.g., maternal levels of androgens, antibodies to male hormones; Cohen-Bendahan, van de Beek, & Berenbaum, 2005).

Although each individual's core identity likely exhibits some degree of malleability, which may make it easier for children to conform to society's dictates, LGBTQ+ advocates and parents of gender-expansive children are rock-solid on one thing: These core identities are often clear to children and they cannot be ignored, subverted, or transformed through external pressures (Besser et al., 2006). Moreover, ***it violates children's rights as humans***, when parents or other members of society attempt to do so.

Development of Sexual Orientation

According to current scientific understanding, individuals are usually aware of their sexual orientation between middle childhood and early adolescence. However, this is not always the case, and some do not become aware of their sexual orientation until much later in life. It is not necessary 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. Some researchers argue that sexual orientation is not static and inborn but is instead fluid and changeable throughout the lifespan.

There is no scientific consensus regarding the exact reasons why an individual holds a particular sexual orientation. Research has examined possible biological, developmental, social, and cultural influences on sexual orientation, but there has been no evidence that links sexual orientation to only one factor (APA, 2016). However, evidence for biological explanations, including genetics, birth order, and hormones, will be summarized since many scientists argue that biological processes occurring during the embryonic and and early postnatal life play the central organizing role in sexual orientation (Balthazart, 2018).

Genetics. Using both twin and familial studies, heredity provides one biological explanation for same-sex orientation. Bailey and Pillard (1991) studied pairs of male twins and found that the concordance rate for

identical twins was 52%, while the rate for fraternal twins was only 22%. Bailey, Pillard, Neale, and Agyei (1993) studied female twins and found a similar difference with a concordance rate of 48% for identical twins and 16% for fraternal twins. Schwartz, Kim, Kolundzija, Rieger, & Sanders (2010) found that gay men had more gay male relatives than straight men, and sisters of gay men were more likely to be lesbians than sisters of straight men.

Fraternal Birth Order. The **fraternal birth order effect** *indicates that the probability of a boy identifying as gay increases for each older brother born to the same mother* (Balthazart, 2018; Blanchard, 2001). According to Bogaret et al. "the increased incidence of homosexuality in males with older brothers results from a progressive immunization of the mother against a male specific cell-adhesion protein that plays a key role in cell-cell interactions, specifically in the process of synapse formation," (as cited in Balthazart, 2018, p. 234). A meta-analysis indicated that the fraternal birth order effect explains the sexual orientation of between 15% and 29% of gay men.

Hormones. Excess or deficient exposure to hormones during prenatal development has also been theorized as an explanation for sexual orientation. One-third of females exposed to abnormal amounts of prenatal androgens, a condition called congenital adrenal hyperplasia (CAH), identify as bisexual or lesbian (Cohen-Bendahan, van de Beek, & Berenbaum, 2005). In contrast, too little exposure to prenatal androgens may affect male sexual orientation by not masculinizing the male brain (Carlson, 2011).

2. Gender awareness. At about age 2-3, toddlers' cognitive development allows them to begin to create representational categories to organize their conceptual thinking about the world. Gender is one of these categories. The ability to classify oneself as male or female is called "**gender awareness**." Children's biological and sexual profiles are built during conception and prenatal development, so they are typically assigned a biological sex at birth, but before toddlers develop the cognitive capacity to categorize, they are blissfully unaware of their gender. Although they have likely been receiving differential treatment from family members since they were born, it is not until they are able to recognize this category and apply it to themselves, that gender becomes psychologically real. Once small children become aware of gender categories, they begin taking notes about the differences between people in these two categories: names, colors, toys, jewelry, clothes, hair length, voices, behavior, and so on.

Baby X. It is important to note that, in a world *without* a gender curriculum, the list children would make of the differences between males and females would be very short: It would include only secondary sexual characteristics of adults and adolescents who are post-puberty. Babies and pre-pubescent children would not be distinguishable by gender– because they have no secondary sexual characteristics. We can imagine a thought experiment in which no one is subject to a gender curriculum. Imagine that each of us receives an envelope at birth with information about our biologically assigned sex inside, but we are not allowed to open it until it becomes relevant, that is, until we reach puberty. In this thought experiment, our parents and society would have to raise us so we would be ready to take on either gender role. They would have to select gender-neutral names, colors for the nursery and our clothes, toys, and so on. Many students find this idea intriguing but also a bit unsettling.

A similar thought experiment was described in an article in 1972 in *Ms. Magazine* entitled "The Story of X," which describes parents who decided to raise their child without revealing its gender to the world (Gould,

1972). Several real parents, in Europe and the US, have also decided to raise their children without revealing their gender. It is fascinating to see how this kind of decision has been received by the media and by other parents. In each case, the firestorm of media attention was so dramatic that parents decided to withdraw their stories (and their children) from scrutiny by the press. Although developmentalists (and parents) can argue about the decision to shield children from society's stereotypes as opposed to helping them recognize, counter, and transcend these stereotypes, the hysteria surrounding decisions to conceal a child's gender are very telling about society's view of the centrality of gender to every child's identity, and society's "right to know."

Gender malleability. When "gender awareness" emerges during early childhood, a key part of the gender schema young children construct includes the notion that any gender categories that they observe are ***malleable***. Because small children in the preoperational stage of cognitive development are not capable of inferring the essential underlying characteristics of gender (just as they cannot infer the defining characteristics of other categories, like animate objects), they see gender assignments as ***temporary*** and ***changeable***. Most young children believe that a person can change from female to male (or vice versa) by cutting their hair or changing their clothes. Little boys often report that they will grow up to be Moms with babies in their tummies; little girls that they will grow up to be Dads. Many adults can remember this state of awareness. For example, one of our students told us about her preschool class in which all the 4-year-olds were boys; she thought that when she turned 4, she would also become a boy. She was looking forward to the transformation, the same way children look forward to getting taller or older or better at riding a bike.

Because many children discuss their desires (and plans) to cross gender lines, parents of gender-non-conforming or transgender children often see these kinds of declarations as a "phase" that children will get over. Parents cannot easily tell when children's statements reflect real underlying convictions that they do not internally identify with the gender roles or expressions that have been assigned to them. However, some gender variant or transgender adults report that their real gender identity was already very clear to them at this age, and parents of such children also confirm that their children were letting them know through word and deed. In fact, the clarity and insistence on a gender variant identity at such a young age (and in the face of such enormous pressure to conform) provides some of the most convincing evidence that children come pre-loaded with their own gender and sexual orientation. At the same time, this narrative does not describe the only pathway. Some gender variant adults report that it was not until they were much older (and sometimes with the aid of therapeutic support) that they were able to understand what was/is happening to them in terms of gender identity and development.

Gender expression. The specific gender differences that show up in a child's gender schema at this age depend on the local social context that the child experiences, which is why many parents decide to minimize young children's exposure to gender-stereotypes . At the same time, for parents who do expect their children to conform to cultural prescriptions for gender-typical dress, toys, and activities, this is the age at which some parents of gender non-conforming or gender-variant children may begin to notice that their child has not gotten the cultural memo. Parents report unease about their boys' exploration of female-stereotyped clothes (such as dresses, tutus, tiaras), accessories (such as high heels, purses, barrettes), toys (especially dolls and doll clothes), and colors—which is why these children have sometimes been dubbed "pink boys."

Note that there has been no parallel study of "blue girls," because tomboys do not as frequently alarm their parents at this age. 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 (Leaper, 2015). 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). For an interesting segment on CNN, see "Why girls can be boyish but boys can't be girlish." As explained by Padawer (2012), "That's because girls gain status by

moving into "boy" space, while boys are tainted by the slightest whiff of femininity. 'There's a lot more privilege to being a man in our society,' says Diane Ehrensaft, a psychologist at the University of California, San Francisco, who supports allowing children to be what she calls gender creative. 'When a boy wants to act like a girl, it subconsciously shakes our foundation, because why would someone want to be the lesser gender?' Boys are up to seven times as likely as girls to be referred to gender clinics for psychological evaluations. Sometimes the boys' violation is as mild as wanting a Barbie for Christmas. By comparison, most girls referred to gender clinics are far more extreme in their atypicality: they want boy names, boy pronouns and, sometimes, boy bodies."

> ***Creation of a "middle space***." One surprisingly simple rule for parents who wish to encourage gender exploration and expansion is that "Colors are just colors, clothes are just clothes, and toys are just toys," meaning that these societal prescriptions are not developmentally real or meaningful. Researchers refer to the overlap between male and female expectations and stereotypes as "the middle space," and suggest that an important role for adults to take on is the expansion of this "middle space." With the sanctioning of the "tomboy" identity, society has begun to allow girls to take up residence in this middle space. Its expansion for girls and its creation for boys are next steps for all of us. In general, the wider the gender expression enjoyed by children of all genders (e.g., girls in sports, boys in cooking, and so on), the healthier everyone's gender identity development is likely to be.

3. Gender constancy. When children reach the concrete operational stage of cognitive development (between ages 5 and 7), they are able to infer that, according to societal dictates, the essential defining feature of maleness and femaleness is, traditionally, based on genitalia. This is also the age at which children are able to infer the inverse principle: If genitalia dictate gender, then all males by necessity have penises and all females have vaginas–which they are often happy to announce at Kindergarten or in other public places. Following from this discovery, children also begin to grasp the fact that their assignment into gender categories is permanent, unchangeable, or constant.

The realization that one is a life-time member of the "boys club" or the "girls club" typically leads to greater interest and more focus on the membership requirements for their particular club. In stereotyped social contexts, children's attitude toward conformity to "gender-appropriate" markers may shift from descriptive to **prescriptive**, in which children so highly identify with markers from their own club, that they begin to denigrate or become repelled by markers of the "wrong" club. These behaviors become visible in boy's resistance to being asked to wear "girl colors" or play "girl games." It is also noticeable in children's attempts to enforce these categories on others—either directly through instructions ("you have to ride a girl's bike") and statements of fact ("this slide is only for boys,"), or indirectly through teasing, taunting, criticism, and ridicule towards any child who crosses the lines.

For gender-nonconforming children or transgender children, this is an age where the psychological costs of society's gender boxes and lines can become apparent. At this age, children can start to sense (or clearly know) that they have been permanently assigned to a biological sex that comes with a narrow gender expression or an eventually gendered-body whose physicality is not consonant with their own internal needs or identity. If so, then confusion or (more or less strong) feelings of gender dissonance may emerge. In the clinical literature, these feelings are sometimes labeled "gender dysphoria" to indicate the sadness and desperation that children may feel when they realize that they have been permanently assigned to the "wrong" gender expression, gender identity, and/or biological sex.

The dangers of pushing children into boxes. LGBTQ advocates point out how crucial it is to create some space for children around these issues to allow them to figure out for themselves where they stand on the many dimensions of gender. For some children, exploring gender expression is just that—they need to spend time in the "middle space." If we have to categorize, these children are gender non-conforming in expression, but gender-conforming in identity and sexual orientation. This can be seen in how annoyed some "pink boys" who wear dresses and long hair become when people mistake them for girls (Padawer, 2012). When asked why this was so annoying, one little guy named P.J. told the reporter about a boy in his third-grade class who is a soccer fanatic. "He comes to school every day in a soccer jersey and sweat pants," P. J. said, "but that doesn't make him a professional soccer player." It's as if these children need to remind adults about the essential defining features of male and female biological sex. P.J. could say, "Duh—I still have a penis, so I am still a boy."

For other children, exploring gender expression is the beginning of the realization that their sexual orientation may not be heterosexual, that they may be gay, lesbian, and/or bisexual. Some writers have tried to quantify the numbers of gender-nonconforming boys, suggesting that 2-7% of boys display nonconforming gender behavior, and of these 60-80% grow up to be gay men (Padawer, 2012). The same tendency is suggested for lesbian women, most of whom identified as "tomboys." It seems that these numbers would be very difficult to confirm, given that more than 75% of women identify as "tomboys" and most of them are heterosexual, and given the stringent attempts to shove gender nonconforming boys back into their boxes which means that we are only observing the most determined and tenacious nonconforming boys.

For some children, gender non-conforming behavior is the beginning of the realization that they are transgender. Some children are very clear on this early on, and insist on names, pronouns, and gender expressions that are consonant with their own internal convictions about their actual gender. Other children need the opportunity to explore and question, and they may not become clear on their sexual orientation or transgender status until they reach puberty or later.

Parents of gender non-conforming children. Gender non-conforming children may be more or less clear about why they need to explore the "middle space," but some parents are just confused. Most of us have been fully socialized in the current gender curriculum and so any activity outside those lines and boxes may seem deeply "wrong" or even "unnatural." That is always the way with strong societal norms. In the 1800s, if a woman showed a glimpse of ankle, she was considered to be immoral; in the 1920s, women wearing pants and short hair were seen as "unnatural;" in the 1960s, boys whose hair touched their collars were suspended from school.

> *"It's not their job to make sure we're all comfortable."*
> *— Parent of a gender non-conforming child.*

Gender non-conforming children provide their adults with the opportunity and motivation to improve society in ways that are more positive for everyone. The need that all children have for their parents' full love and support encourages adults to grow outside of their comfort zones, and to develop into better parents. As Brill and Pepper (2008) point out, "It takes courage to follow the path of love." They provide many good strategies and resources for parents who are trying to follow this path. They point out that some of parents' reluctance can be based on their fear of others looking down on them and criticizing their parenting. We think that many parents can relate to this fear—even in little ways, such as when a child throws a fit in the store or we are called into school for a child's infraction. We are

worried that our parenting is inadequate or that others will think we are inferior parents. That is one important reason why Brill and Pepper (2008) insist that parents get support for themselves (from therapists or groups of like-minded parents) so the they will be able in turn to provide acceptance and support for their children.

Some of the reluctance of parents of transgender children can be based in grief over the loss of their previous child. We think that many parents can also relate to this feeling—when we look at photos of our children as babies and young children, we miss those darling little versions of our children. At the same time, we know that they are still there in the core identity of our older children. And parents of gender variant children can be comforted with the idea that the essence of their child, their child's core, is still there, and still intact. Most parents also feel vindicated when they see their child's distress and depression lift (some children are actually suicidal), and watch them bloom in their new affirmed identity, showing joy and delight in the free expression of their authentic selves.

Dealing with discrimination and bullying. An important part of parents' reluctance to support gender variant children can be based on fears about the reactions their children may encounter in school, church, or other public places. Parents are not wrong about these reactions, and their desire to protect their children is understandable. These same issues have been faced by parents of children who belong to racial, ethnic, and cultural minorities—who also have to face messages of hate, discrimination, and oppression. One difference may be that some parents feel that their gender variant child could avoid all these upsetting experiences if only they would conform, whereas most Black parents do not see the solution to racism as encouraging their children to "pass" as white. Research on parenting children from racial and ethnic minority backgrounds suggests that the most helpful approach involves proud support for a child's minority status and engaged participation with minority communities, combined with realistic training about how to deal constructively with incidents of intolerance. Some parenting guides suggest strategies organized around the notions of: (1) Talk: speak up for what you believe; (2) Walk: find a safe space; and (3) Squawk: find someone who will support you.

At the same time, many parents may surprise themselves by becoming staunch advocates for their children's rights and activists in the larger societal movement for gender respect and equality. Luckily, as parents work hard to see that their children are treated fairly everywhere they go, there are good programs that can be used to improve schools. These programs train teachers, administrators, and staff how to celebrate and support gender diversity. The good news is that such trainings can have positive effects for everyone involved.

4. Gender latency. A fourth major developmental milestone takes place during middle childhood, sometimes referred to as the "latency" stage or phase, and loosely modeled after Freud's description of children's psychosexual stages. During this period (about ages 8 or 9 until puberty), children seem to be less active in working out issues explicitly connected to gender or sexual identity. In general, children seem to be more mellow or laid back about the whole "gender thing," largely recognizing that scripts about gender-appropriate signifiers (like colors, behaviors, or activities) are societal conventions and not true moral issues. At this age, children seem to relax their enforcement of gender rules and the "yuckiness" of the opposite sex begins to fade. Many gender variant children, during this period, also seem to relax, maybe deciding that non-conformity is more trouble than it is worth, and so (at least temporarily) adopting conventional signifiers that are more aligned with their biological sex.

For parents who are worried about the effects of hetero-normative gender stereotypes, it can feel like your child has made it safely through the gender curriculum and come out whole on the other side. For parents who are worried about their gender-nonconforming children, it can also feel like the "problem" has been solved and it was (after all) just a phase.

5. Puberty and the gender police. A fifth major milestone in gender development is ushered in by puberty, which usually starts between ages 10-12 for girls and between ages 12-14 for boys. The reality of biological changes in both primary and secondary sexual characteristics seems to trigger a major shift, not only in children's neurophysiology, but also in their psychological systems and social relationships. When puberty strikes, the issue of what it means to be male and female in this historical moment seems to come to center stage, and teenagers in middle school and early high school seem to be trying to *enact and rigidly enforce all of society's current stereotypes about gender*. This process is labeled "**gender intensification**" and it will be more or less "intense" depending on the local culture, their stereotypes, and the rigidity with which they are viewed.

Gender intensification. This is the moment at which adolescents seem to want to wring any gender variation out of themselves and their peers, and this goes for kids who vary on expression, identity, sexual orientation, and transgender status—which basically includes everyone. So pressure is exerted on girls to look and act more like girls—and we see girls try to bring themselves into line with cultural stereotypes about the value of beauty through increased use of make-up, clothes, and hairstyles as well as through a focus on diet, exercise, and eating disorders; we also see normative losses in self-esteem as girls find themselves unable to reach these idealized female appearances and increasingly internalize a negative body image. The pressure that is exerted on boys to look and act like boys can be observed as boys try to bring themselves into line with cultural stereotypes about the value of power, through adolescents' increased use of aggression and bullying, boys' frequent lapses into silence, as well as increased focus on body building and the abuse of steroids. Both genders are at risk for commodifying the opposite sex—girls can regard "boyfriends" as status objects just as boys can regard girls as sexual targets. Perhaps surprisingly, the local external pressures to adhere to societal gender stereotypes seem to originate largely *within* gender, in that girls tighten the screws on other girls to conform whereas boys are the ones who are pressuring other boys. During early adolescence, some researchers refer to the phase of gender intensification as a period that is run by the "gender police."

It is important to note that the gender harassment and bullying that is still so common in schools and neighborhoods is often aimed at heterosexual youth who do not conform to societal boxes and lines, such as late-maturing boys who are small, slight, and shy. Of course, the further that a child strays over gender lines, the more they are likely to become targets of harassment and bullying, not only by peers but also by parents, teachers, and societal institutions.

Gender contraction. In a way this phase could also be referred to as a period of "gender contraction," in that some adolescents fall over themselves to jump back into the boxes and over the lines prescribed by society, especially in terms of gender expression. However, the onset of puberty also brings additional biological information to some adolescents, indicating (or verifying) that they may be (or definitely are) gay, lesbian, bisexual, queer, or transgender. This new information (or clarity) comes at exactly the same time that the external world brings increased pressure for them to conform. Such social pressures (and the internal pressures they can create) can collide with adolescents' natural sexual urges to create confusion and internal gridlock. For some youth, when their internal states (biological urges, gender identity, and sexual orientation) are aligned, they may achieve internal clarity—"Ah-ha, I'm gay (or lesbian or bisexual)!" Some adults describe this process as "coming out to oneself." But for many gender variant youth, external pressure and homophobia can make this process feel very confusing and dangerous. For these children, their adolescent peers (and often parents, siblings, and teachers) feel more like "gender Nazis."

Pause on puberty. For some youth, the beginnings of puberty may trigger an awareness of (or verify) their transgender status—"My body is going the wrong direction here—wait!" In fact, one cutting edge strategy for children who may be transgender is to stop the transformation—literally using hormone blockers that halt the onset of puberty. This strategy creates a space that preserves children's options. It is much easier

physiologically to transition to another gender *before* puberty has been completed. This allows for a transition that is more complete and requires fewer surgeries. For parents of transgender children who want to give their child the opportunity to make an autonomous informed decision, the use of hormone blockers allows children to continue developing cognitively so that their decision can be made using all the capacities of formal operations. Families also benefit from the participation of experienced therapists and physicians, who can help guide them in the sequence and timing of each step.

LGBTQ advocates also insist that it is important to *follow* the child's lead, and not to get ahead of them. Some families can be so confused by a child's non-conforming gender expression that they pressure the child to change their biological sex in order to produce a child who is culturally "aligned" in expression, identity, and biology. In fact, as previously mentioned, many transgender individuals do not choose to make a physical transition at all.

In every case, children need full family support in order to negotiate the external pressures they will likely experience and otherwise internalize. If transgender teens decide to transition during high school, some experts recommend allowing the child to take a year off from school or be home-schooled for a year, so that they are sheltered from external scrutiny. Some families also decide that the child should then return with their new identity to a different school, but other transgender teens report that an important part of the process of self-acceptance is the experience of winning over support from their current peers. In their stories of transition (Kuklin, 2014), some teens seem remarkably understanding of the reluctance and flak they experience in forging a new identity, even though all of them make clear that such resistance (and in many cases overt hostility) causes real pain and suffering.

6. Identity development during college and the freedom to explore and expand. For many youth, the full development of an authentic gender identity doesn't take place until after high school, which is why the college years are such a common time for gender confirming and non-conforming youth to be working on issues of gender identity and sexual orientation. Developmentally, these are good years for many reasons. In most strata of society, the "gender police" start to fade during mid-adolescence and, by emerging adulthood, most forms of gender expression are again viewed as conventions and not as moral prescriptions, so the previously intense external pressures are often more relaxed (again—depending on local geographical and religious perspectives).

Youth themselves have newly emerging meta-cognitive capacities to reflect on their own internalized stereotypes and shame, allowing them to be able to rework for themselves their own attitudes about gender and sexuality. Because many students are working on these issues, college is also a place where questioning youth can more easily find open and understanding social and sexual partners with whom they can safely explore these issues. Moreover, college campuses can be places that provide formal resources (e.g., Queer Resource Center, LGBTQ groups) and informal role models, that encourage youth to discover, liberate, and celebrate their authentic selves.

Exploration and commitment. During the years of emerging adulthood, many youth are figuring out that they can create their own narratives about what it means to be male and female in society. Many will affirm a positive appraisal of their assigned sex as an anchor of their gender identity, but at the same time accept and enjoy a wide-ranging set of expressions, activities, and roles that are vastly expanded compared to societal stereotypes. In fact, increasingly, many will come to view the "middle space" as occupying pretty much all the space depicting gender roles, so much so that for many young adults, the issues surrounding biological sex, that is, being male or female, begin to shrink until gender is a very small, almost incidental, part of their identity. Of course, young adults often return to these issues and what

they mean as they approach the developmental task of "intimacy," which is often worked on in the context of sexual relationships.

Some LGBTQ youth report that emerging adulthood was a good time for them to deal with these issues because they needed to wait until they had worked out other less-contested aspects of their identity so they could be strong and self-confident enough to face and explore issues of sexual orientation and gender identity in a society that is so openly hostile to gender expansion. For example, some youth reported feeling mixed up about gender identity and sexual orientation. Some transgender youth felt that they were not allowed to be sexually attracted to people who were of the sex opposite to their original biological sex. For example, if I am assigned a female biological sex at birth and later realize that I am an affirmed (transgender) male, what does it mean if I am attracted to biological males? Does that threaten my identity as an affirmed male? During early adulthood, transgender youth can come to accept what LGBTQ experts confirm—that transgender status and sexual orientation are separate issues. An affirmed male who is attracted to other men is a gay transgender male person. All combinations are possible.

Sex/Gender Differences

As part of the study of gender development, researchers are also interested in examining sex/gender differences in psychological characteristics and behaviors. Researchers who favor different meta-theoretical perspectives often assume that gender differences are due to underlying differences in biology (consistent with maturational metatheories) or differences in socialization (consistent with mechanistic meta-theories). However, consistent with contextualist meta-theories, to date most of the differences that have been found have turned out to be a complex combination of neurophysiological sex differences (e.g. the effects of sex hormones on behavior), gender roles (i.e., differences in how men and women are supposed to act), gender stereotypes (i.e., differences in how we *think* men and women are), and gender socialization.

What are these gender differences? Research suggests that they are concentrated in six areas.

1. ***Activity level***. In terms of temperament, boys show higher activity levels starting at birth, as seen in differences in muscle tone, muscle mass, and movement; as they get older, boys remain somewhat more active and have more difficulty in activities that require holding still. Some of the biggest differences involve the ***play styles*** of children. Boys frequently play organized rough-and-tumble games in large groups, while girls often play less-physical activities in much smaller groups (Maccoby, 1998).
2. ***Verbal ability***. Girls develop language skills earlier and know more words than boys. They show slightly higher verbal abilities, including reading and writing, all throughout school, and are somewhat more emotionally expressive (of fear and sadness, but not anger).
3. ***Visuo-spatial ability***. Boys perform slightly better than girls on tests of visuo-spatial ability (e.g., tests of mentally rotating 3-D objects), differences which can later be seen in activities like map reading or sports that require spatial orientation.
4. ***Verbal and physical aggression***. Starting at about the age of 2, boys exhibit higher rates of unprovoked physical aggression than girls, although no gender differences have been found in provoked aggression (Hyde, 2005). At every age, boys show higher levels of physical aggression, but starting in adolescence, girls show higher levels of relational aggression (e.g., social shunning, gossiping, power exertion).
5. ***Self-regulation and prosocial behavior***. At about the same age that gender differences in aggression emerge (approximately age 2), gender differences also emerge in levels of self-regulation, compliance, empathy, and prosocial behavior. Girls show better behavioral and emotional self-regulation, whereas boys have more trouble minding and following rules and routines. As they get older boys are also slightly less able to suppress inappropriate responses and slightly more likely to blurt things out than girls (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). At the same time, girls are also more likely to offer praise, to agree with the person they're talking to,

and to elaborate on the other person's comments; boys, in contrast, are more likely to assert their opinion and offer criticisms (Leaper & Smith, 2004). The combination of higher levels of aggression and lower levels of self-regulation is a primary reason why, compared to girls, boys at every age are more likely to be disciplined (as well as suspended and expelled) in school.

6. ***Developmental vulnerability***. One of the biggest and most consistent set of sex/gender differences between girls and boys is found in the area of developmental vulnerability. Boys are more likely than girls to show markers of a wide range of biological and psychological vulnerabilities, including prenatal and perinatal stress and disease (e.g., lower survival rates in premature birth, higher rates of infant mortality and death from SIDS), learning disabilities (e.g., dyslexia, speech defects, mental retardation), neurological conditions (e.g., autism, attention deficit disorder, hyperactivity), and mental health conditions (e.g., opposition/defiant disorder, schizophrenia). Starting in early adolescence, compared to girls, boys are more likely to be involved in acts of anti-social behavior, delinquency, and violent crime, and to be incarcerated. Unlike differences in psychological characteristics, which tend to be small and inconsistent, gender differences in these markers of vulnerability tend to be large and robust. For example, rates of ADHD and autism are 3-5 times higher in boys, and over 90% of inmates are male. Differences in diagnosis may represent actual differences in incidence, or conditions may present differently in girls than in boys.

   The only mental health conditions more prevalent in girls are internalizing disorders (i.e., depression and anxiety) but boys have higher rates of completed suicide at every age, with an increasing gap over adulthood, until by age 65 over 70% of suicides are committed by men. https://www.bbc.com/future/article/20190313-why-more-men-kill-themselves-than-women

Magnitude of gender differences. It is important to note that, with the exception of sex/gender differences in physical characteristics (e.g., height and muscle mass) and developmental vulnerability, sex/gender differences in psychological characteristics and behaviors tend to be quite small, inconsistent, and change over historical time. Even where sex/gender differences are found, there is a **great deal of variation** *among* females and *among* males, meaning that individual boys are very different from one another as are individual girls. As a result, knowing someone's gender does not help much in predicting their actual attributes or behaviors. For example, in terms of activity level, boys are considered more active than girls. However, 42% of girls are more active than the average boy (but so are 50% of boys). Figure 1 depicts this phenomenon in a comparison of male and female self-esteem. The two bell-curves show the range in self-esteem scores *within* boys and *within* girls, and there is enormous overlap. The average gender difference, shown by the arrow at the top of the figure, is tiny compared to the variation within gender.

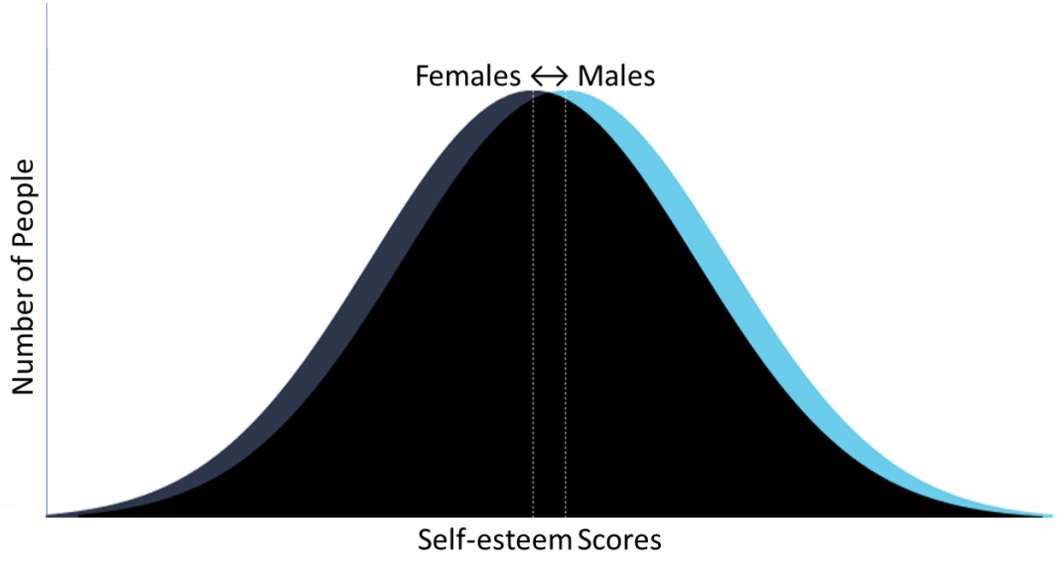

Figure 6.16. While our gender stereotypes paint males and females as drastically different from each other, even when a difference exists, there is considerable overlap in the levels of that trait between genders. This graph shows the average difference in self-esteem between boys and girls. Boys have a higher average self-esteem than girls, but the average scores are much more similar than different. This visualization was created based on Hyde, 2005 and Cohen's D effect sizes reported in Kling et al, 1999.

Furthermore, few gender differences reflect innate biological differences, but instead reflect complex mixtures of neurophysiological and social factors, with a special emphasis on the specific societal and familial gender curriculum that creates sets of differential opportunities, treatment, and experiences for girls and boys. For example, one small gender difference is that boys show better spatial abilities than girls. However, Tzuriel and Egozi (2010) gave girls the chance to practice their spatial skills (by imagining a line drawing was different shapes) and discovered that, with practice, this gender difference completely disappeared. Likewise, those differences also disappear in groups of girls who are involved in sports which require spatial practice. The fact that gender differences that previously were significant (e.g., boys performed better on math achievement tests during early adolescence) have disappeared over time suggests that they are largely a function of environmental differences (in this case, the number of math classes taken).

Some of the most interesting research on sex/gender differences today critiques this entire area of work and argues that many domains that we assume differ across genders, including some described here in your textbook, are really based on gender stereotypes and not actual differences. Researchers conducted large **meta-analyses** (statistical analyses that allow researchers to systematically combine findings across an entire body of studies) of thousands of studies across more than a million participants, and concluded that: Girls are *not* more fearful, shy, or scared of new things than boys; boys are *not* more angry than girls and girls are *not* more emotional than boys; boys do *not* perform better at math than girls; and girls are *not* more talkative than boys (Hyde, 2005). These meta-analyses have also been conducted on studies involving adults, with much the same conclusion (Carothers & Reis, 2013; Hyde, Bigler, Joel, Tate, & van Anders, 2019).

Liberating Society from Status Hierarchies of Gender and Sexuality

Societies play a crucial role in gender development by trying to dictate hierarchies of human worth based on gender and sexuality. Gender is multi-faceted and so status hierarchies cover biological sex, gender expression, sexual orientation, and identity. Hierarchies are apparent in the relative value placed on males versus females, on people who are heterosexual versus lesbian, gay, bisexual, queer, and transgender, and on people who conform to the gender binary versus people who do not. Some of these hierarchies are enshrined in law, for example, when women were not allowed to vote, or homosexuality was illegal, or laws refuse to recognize the legitimacy of transgender sexual identities.

These status hierarchies are enforced in all the ways we discussed in previous readings on higher-order contexts of development, including implicit bias, prejudice, stereotypes, segregation, exclusion, and discrimination. Discrimination persists throughout the lifespan in the form of obstacles to education, or lack of access to political, financial, and social power. Status hierarchies also involve entrenched myths about subgroups who fall into different rungs of the societal ladders of these hierarchies, and cover stories that membership in some of these groups is voluntary and something youth should "get over." The negative stories society tells are hurtful, especially if children and youth internalize them. At the same time, the development of people at the top of these hierarchies can also be adversely affected, as when narrow definitions of masculinity can impede the development of boys and men, and narrow definitions of heterosexuality can interfere with the sexual exploration of youth.

Societal myths about gender minorities are especially harmful when they infect parents and families who are supposed to be protecting children and promoting their development. For children from racial and ethnic minority backgrounds, their staunchest supporters typically are parents, extended family, and racial and ethnic communities, who counteract these myths and provide counter-narratives of positivity, pride, and cultural heritage. However, for children from gender minorities, parents and families may not serve this vital role. Because parents often do not share their child's gender identity, and may sometimes even harbor entrenched myths of revulsion, children from gender minorities do not always have the layers of protection provided by extended family, that serve to buffer them from the worst of society's prejudices. In fact, some of the most hurtful messages may come from family and friends. These status hierarchies and the entrenched myths used to enforce them create hazardous conditions for the development of children and youth. A growing realization of their extent and severity should create an even greater sense urgency for taking collective action

to abolish them. In the meantime women's groups and the LGBTQ+ community are creating safe spaces where their members can experience the support and validation they deserve and develop strategies for resistance and resilience.

These issues are of global concern (WHO, 2011). Although we are rightfully worried about status hierarchies in the US, many countries around the world have much worse (and sometimes life-threatening) conditions for women and girls, LGBTQ+ youth and adults, and gender minorities. For example, in some countries where gender preferences are pronounced, it is no longer legal to give parents information on the sex of their fetus because selective abortion of females has created a gender imbalance that is noticeable at the national level. In many cultures, women do not have access to basic rights (e.g., to education, freedom of movement, choice of spouses and sexual partners, etc.), and sexual minorities who express their preferences openly do so at risk of imprisonment and death.

What are the impacts of enforcing gender stereotypes and valuing or devaluing particular gender identities?

Like all status hierarchies, these societal conditions exert a downward pressure on healthy development. In the United States, 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. These messages dictate not only how people should act, but also the opportunities they are given, how they are treated, and the extent to which they can grow into their full potential. Even into college and professional school, women are less vocal in class and much more at risk for sexual harassment from teachers, coaches, classmates, and professors. These patterns are also found in social interactions and in media messages. In adulthood, these differences are reflected in income gaps between men and women (women working full-time earn about 74 percent the income of men), in higher rates of women targeted for rape and domestic violence, higher rates of eating disorders for females, and in higher rates of violent death for men in young adulthood.

The effects of discrimination and bullying can also be seen in disparities in physical and mental health for youth who belong to minority gender identities and sexual orientations (see boxes). Although researchers and other adults are rightfully concerned about these disparities, it is important not to buy into **deficit assumptions**, where researchers assume that children and youth at the bottom of these status hierarchies (i.e., females and those with minority gender identities and sexual orientations) are somehow "at risk," "vulnerable," or "less than." We need to protect all children and youth from social contextual conditions that are dangerous for their development, but just like youth from ethnic and racial minorities, youth from sexual and gender minorities generally grow up whole, healthy, and resilient.

Optional Reading:

In this brief article, authors Leaper and Brown (2018) summarize findings on the impact that gender–and specifically gender roles, stereotypes, and discrimination–have on children's development. In three sections (beginning on page 2), their paper reviews recent research on how these factors impact development in areas of gender identity and expression, academic achievement, and harassment, respectively.

Click here to read: Leaper, C., & Brown, C. S. (2018). Sexism in childhood and adolescence: Recent trends and advances in research. *Child development perspectives*, 12(1), 10-15.

Note: There is some disagreement among researchers on the exact meaning of the term "sexism." The authors of this paper use the term "sexism" to refer to gender roles, stereotypes, discrimination, biases (positive and negative), and gender differences, as well as general beliefs, cognitions, and expectations about gender. We prefer the more-common usage of "sexism" as referring to gender discrimination in line with the status hierarchy defined above (i.e. with women and LGBTQ individuals at the bottom), that gender discrimination

refers to any discrimination on the basis of gender (e.g. against men or women), and although concepts such as gender roles and gender cognitions are related to sexism, they are distinct ideas and better referred to with more precise terms.

Discrimination based on Sexual Orientation. The United States is **heteronormative**, *meaning that society supports heterosexuality as the norm.* Consider, for example, that homosexuals are often asked, "When did you know you were gay?" but heterosexuals are rarely asked, "When did you know you were straight?" (Ryle, 2011). Living in a culture that privileges heterosexuality has a significant impact on the ways in which non-heterosexual people are able to develop and express their sexuality.

Open identification of one's sexual orientation may be hindered by **homophobia** *which encompasses a range of negative attitudes and stereotypes toward homosexuality or people who are identified or perceived as being lesbian, gay, bisexual, or transgender (*LGBT). It can be expressed as antipathy, contempt, prejudice, aversion, or hatred; it may be based on irrational fear and is sometimes related to religious beliefs (Carroll, 2016). Homophobia is observable in critical and hostile behavior, such as discrimination and violence on the basis of sexual orientations that are non-heterosexual. Recognized types of homophobia include **institutionalized homophobia,** *such as religious and state-sponsored homophobia*, and **internalized homophobia** *in which people with same-sex attractions internalize, or believe, society's negative views and/or hatred of themselves.*

Sexual minorities regularly experience stigma, harassment, discrimination, and violence based on their sexual orientation (Carroll, 2016). Research has shown that gay, lesbian, and bisexual teenagers are at a higher risk of depression and suicide due to exclusion from social groups, rejection from peers and family, and negative media portrayals of homosexuals (Bauermeister et al., 2010). Discrimination can occur in the workplace, in housing, at schools, and in numerous public settings. Major policies to prevent discrimination based on sexual orientation have only come into effect in the United States in the last few years.

The majority of empirical and clinical research on LGBT populations are done with largely white, middle-class, well-educated samples. This demographic limits our understanding of more marginalized sub-populations that are also affected by racism, classism, and other forms of oppression. In the United States, non-Caucasian LGBT individuals may find themselves in a double minority, in which they are not fully accepted or understood by Caucasian LGBT communities and are also not accepted by their own ethnic group (Tye, 2006). Many people experience racism in in the dominant LGBT community where racial stereotypes merge with gender stereotypes.

Discrimination based on Gender Minority status. Gender nonconforming people are much more likely to experience harassment, bullying, and violence based on their gender identity; they also experience much higher rates of discrimination in housing, employment, healthcare, and education (Borgogna, McDermott, Aita, & Kridel, 2019; National Center for Transgender Equality, 2015). Transgender individuals of color face additional financial, social, and interpersonal challenges, in comparison to the transgender community as a

whole, as a result of structural racism. Black transgender people reported the highest level of discrimination among all transgender individuals of color. As members of several intersecting minority groups, transgender people of color, and transgender women of color in particular, are especially vulnerable to employment discrimination, health disparities, harassment, and violence. Consequently, they face even greater obstacles than white transgender individuals and cisgender members of their own race.

Effects of Gender Minority Discrimination on Mental Health. Using data from over 43,000 college students, Borgona et al. (2019) examined mental health disparities among several gender groups, including those identifying as cisgender, transgender, and gender nonconforming. Results indicated that participants who identified as transgender and gender nonconforming had significantly higher levels of anxiety and depression than those identifying as cisgender. Bargona et al. explained the higher rates of anxiety and depression using the ***minority stress model***, which holds that an *unaccepting social environment results in both external and internal stress which can take a toll on mental health.* External stressors include discrimination, harassment, and prejudice, while internal stressors include negative thoughts, feelings and emotions resulting from societal messages about one's identity. Borgona et al. recommend that mental health services be made accessible that are sensitive to both gender minority and sexual minority status.

How do we create gender-affirming social contexts for children and youth?

Starting at birth, children learn the social meanings of gender from their society and culture. Gender roles and expectations are especially portrayed in children's toys, books, commercials, video games, movies, television shows and music (Knorr, 2017). Therefore, when children make choices regarding their gender identification, expression, or behavior that do not conform to gender stereotypes, it is important that they feel supported by the caring adults in their lives. This support allows children to feel valued, resilient, and develop a secure sense of self (American Academy of Pediatricians, 2015). People who care about the healthy gender development of children and youth, like their parents, families, friends, classmates, schools, and communities, can create local contexts of celebration and validation that allow all children to form complex and multifaceted gender identities. Collective social movements around LGBTQ+ and women's rights are having many positive effects in changing current status hierarchies, which will result in social contextual conditions that are better for all our development.

Developmental psychologists, psychiatrists, and pediatricians can play important roles in creating gender-affirming support for children, youth, and families. For example, in a recent paper on the development of transgender youth, Diamond (2020) points out that, "physicians' and psychologists' lack of knowledge about transgender and nonbinary identities can be a significant barrier to competent care (American Psychological Association, 2015). Current practice guidelines for both the medical and psychological treatment of transgender youth adopt a gender-affirmative model of care, which views gender variation as a basic form of human diversity rather than an inherent pathology, and which takes a multifaceted approach to supporting and affirming youth's experienced gender identity and reducing psychological distress… Providing youth—and parents—with more time, support, and information about the full range of gender diversity, and the fact that gender expressions and identities may change dynamically across different stages of development, may help facilitate more effective decisions about social and medical transitions" (p.112).

Developmental researchers can also make contributions by continuing to explore these complex issues. For example, few studies have been conducted to date, and so more research is needed, on the development of ingroup/outgroup biases (preferences for one's own gender), reactions to gender norm violations, awareness of preferential treatment, gender prejudice and discrimination, and bullying based on gender variation (Martin & Ruble, 2010). Interventionists can work to identify the conditions that promote healthy gender and sexual development. Such studies have shown,

for example, the beneficial effects of inclusive sex education programs in school that foster awareness and acceptance of gender diversity. As Diamond (2020) concludes, "studies suggest that the most beneficial intervention approaches involve creating safe and supportive spaces for all youth to give voice to diverse experiences of gender identity and expression; educating peers, schools, communities, and families about the validity of transgender and nonbinary identities; and providing youth with access to supportive and informed care… In light of the complexity of adolescent gender variation, the best course of action for all youth might involve expanding the gender-affirmative model beyond the conventional gender binary, thereby providing a broader range of options for identity and expression, and affirming and supporting the experiences of youth with complex, nonbinary identities… Whether a child identifies as male, female, transgender, gender fluid, or nonbinary, environments that foster self-acceptance, validation, openness, broadmindedness, and support regarding gender expression will yield lasting benefits." (p. 113)

Optional Reading:

Current research is now looking at those young children who identify as transgender and have socially transitioned. In 2013, a longitudinal study following 300 socially transitioned transgender children between the ages of 3 and 12 began (Olson & Gülgöz, 2018). Socially transitioned transgender children identify with the gender opposite to the one they were assigned at birth, and they change their appearance and pronouns to reflect their gender identity. Findings from the study indicated that the gender development of these socially transitioned children looked similar to the gender development of **cisgender** children, or *those whose gender is aligned to the sex they were assigned at birth.* These socially transitioned transgender children exhibited similar gender preferences and gender identities as their gender matched peers. **Further, these children, who were living every day according to their gender identity and were supported by their families, exhibited positive mental health.**

Click here to read: Olson, K. R., & Gülgöz, S. (2018). Early findings from the Transyouth Project: Gender development in transgender children. *Child Development Perspectives, 12*(2), 93-97.

Olson and Gülgöz' study not only echoes an increasing consensus among pediatricians and other experts in child development that affirming non-conforming children in their own felt sense of gender seems to be the best course for promoting children's development (e.g. Rafferty, Donaldson, & Forcier, 2020) and also underlines an important **takeaway lesson**: Increasingly, it seems that it is possible to **reduce the negative outcomes** reported previously for gender non-conforming children if children are supported by their families, schools, and societies in developing into their authentic selves.

Complexity, Truth, and Beauty

Gender development is inherently complex, involving many dimensions of biological sex, gender expression and identity, as well as temperament, intrinsic interests, cognitive constructions, social relationships, and changing historical and societal frames. Together, these forces create an infinite number of unique and individual pathways, which cannot be captured by two boxes and cannot be nurtured by drawing and enforcing arbitrary lines. Notions like gender expansion, creativity, and fluidity can become goals that we both support and strive for in our own development and in the development of all those whose nurturance has been entrusted to us.

Intelligence, Education, & Motivational Development

Development of Self-Understanding

Self-concept *refers to beliefs about general personal identity* (Seiffert, 2011). These beliefs include personal attributes, such as one's age, physical characteristics, behaviors, and competencies. Children in middle and late childhood have a more realistic sense of self than do those in early childhood, and they better understand their strengths and weaknesses. This can be attributed to greater experience in comparing their own performance with that of others, and to greater cognitive flexibility. Children in middle and late childhood 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.

Figure 7.1. Hopefully these children have self-efficacy about playing the violin

Another important development in self-understanding is **self-efficacy**, *which is the belief that you are capable of carrying out a specific task or of reaching a specific goal* (Bandura, 1977, 1986, 1997). Large discrepancies between self-efficacy and ability can create motivational problems for the individual (Seifert, 2011). If a student believes that he or she can solve mathematical problems, then the student is more likely to attempt the mathematics homework that the teacher assigns. Unfortunately, the converse is also true. If a student believes that he or she is incapable of math, then the student is less likely to attempt the math homework regardless of the student's actual ability in math. Since self-efficacy is self-constructed, it is possible for students to miscalculate or misperceive their true skill, and these misperceptions can have complex effects on students' motivations. It is possible to have either too much or too little self-efficacy, and according to Bandura (1997) the optimum level seems to be either at, or slightly above, one's true ability.

Theories of Intelligence

Figure 7.2. Alfred Binet

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.

General (g) versus Specific (s) Intelligences. 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.

Although there is general agreement among psychologists that "g" exists, there is also evidence for **specific intelligence** or"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.

Triarchic Theory. One advocate of the idea of multiple intelligences is the psychologist Robert Sternberg. Sternberg has proposed a **triarchic (three-part) theory of intelligence** which holds 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

& Bachtiar, 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 Table 7.1.

Table 7.1 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

adapted from Lally & Valentine-French, 2019

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, & Okagaki, 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 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).

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. Table 7.2 lists Gardner's eight specific intelligences.

Table 7.2 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

Adapted from Gardner, H. (1999). Intelligence reframed: Multiple intelligences for the 21st century. New York, NY: Basic Books.

Gardner identified these 8 intelligences using multiple sources of evidence. He conducted psychometric analyses of tests designed to capture different kinds of intelligence. He also examined evidence from studies of children who were talented in one or more areas, and from studies of adults who suffered brain damage from strokes that compromised capacities in some areas, but not in 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). A potential ninth intelligence; that is, existential intelligence, still needs empirical support.

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. Are 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).

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). Whether people are actually getting smarter, however, is debatable (Neisser, 1997). Most of the increase in IQ occurred during the second half of the 20th century. Recent research has found a reversal of the Flynn effect in several nations around the world, although some nations still show an increase in IQ scores (Dutton, van der Linden, & Lynn, 2016).

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:

IQ = mental age ÷ chronological age × 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.

Wechsler Scales. A number of scales are based on the IQ. 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.

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 Tests of Intelligence. 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.

- This **required video** explores the history of intelligence tests, including their initial creation, their use to justify eugenics practices, and their inherent flaws.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=111#oembed-1

Education

Remember the ecological systems model (Bronfenbrenner, 1979) that we explored in chapter one? This model helps us understand an individual by examining the contexts in which the person lives and the direct and indirect influences on that person's life. School becomes a very important component of children's lives during middle and late childhood, and parents and the culture contribute to children's educational experiences through their interaction with teachers and schools.

Gender. The stereotypes held by parents and teachers can influence children's self-efficacy in various domains. For example, teachers who hold the view that girls are better at reading (Retelsdorf, Schwartz, & Asbrock, 2015) or boys are better at math (Plante, de la Sablonnière, Aronson, & Théorêt, 2013) often find that their students' performance in these areas mirror these stereotypes, despite the children's actual ability, or the ability of children in the classrooms of teachers who do not hold such stereotypes. While not all children will internalize the views of others, those who do are more likely to show declines in their performance consistent with the stereotypes (Plante, et al., 2013; Retelsdorf et al., 2015).

Parental Involvement in 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 will 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 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 about different kinds of 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.

Cultural Differences in the Classroom

Bilingualism in Schools. In 2013, approximately 20% of school aged children and adolescents spoke a language other than English in the home (Camarota & Zeigler, 2014). The majority of bilingual students speak Spanish, but the rest represent more than three 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 different language

backgrounds at the same time. 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. That is, children can be bilingual without being biliterate. Whatever the case, each bilingual student brings unique strengths and poses unique challenges to teachers.

The student who speaks both languages fluently has a definite cognitive advantage. As you might suspect, and research confirms, 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).

Figure 7.3. Image by unique hwang from Pixabay

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 middle class American classrooms, they can create misunderstandings between teachers and students (Cazden, 2001; Rogers, et al., 2005). Consider these examples:

- *Speaking*. 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*. 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 lack of eye contact as a sign of indifference or disrespect.
- *Social distance*. 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 a 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 reserved.
- *Wait time*. 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.

- *Questions*. 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.

Figure 7.4.

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 **Every Student Succeeds Act** (ESSA) (United States Department of Education, 2017). 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.

The Development of Motivation: Mindsets

Mindsets are organized sets of beliefs people have about the nature of ability and what they themselves are capable of learning. They are convictions people come to hold about how competent they are and whether there are limits to how much more competent they can become.

Where do mindsets come from?

According to theories of *mastery motivation*, babies are born active and curious, ready to learn about the world and see how it works. As a result, infants are highly motivated and busy trying to make things happen—they love to "create effects," for example, by waving their arms around, dropping spoons, splashing in the bath, pulling on earrings, and so on. Mastery motivation (sometimes called *intrinsic* motivation) is like a motor that sets in motion thousands of these exploratory interactions, and through them, babies learn an enormous amount about how to be effective in producing desired and preventing undesired outcomes.

How do mindsets develop?

As children learn about their environments, however, they are also learning something about themselves: that they are competent, efficacious little people, capable of making things happen. They take these beliefs with them into other learning contexts, like school, and such beliefs provide an underlying source of confidence, determination, and persistence, especially when children run into problems or setbacks.

This sense of confidence and competence is called a *mastery orientation*, and it is one basis for children's constructive engagement with challenging learning activities. When children with a mastery orientation make mistakes or can't solve problems right away, they roll up their sleeves and work harder, their concentration and strategizing increases, they turn on the effort and don't give up. As a result, they *learn* from their mistakes and benefit from challenges and difficulties. They not only *feel* more competent and efficacious, they actually *become* more competent as a result. Over time, these experiences strengthen their mastery orientation.

Do all children have a mastery orientation?

No, unfortunately, many infants and young children grow up in environments where they do NOT have experiences of competence and control. Their parents are not responsive, they do not come when babies call, or comfort them when they are upset. Parents may even be downright hostile. Children soon learn that their actions don't matter, that they have no control over their little worlds. This is called a *learned helplessness* orientation, and it can be seen in infants as young as 4 months old.

What are the effects of a learned helplessness orientation?

Children take helpless attitudes with them into learning contexts, too. Unlike the mastery oriented children, however, children with a learned helplessness orientation react to obstacles or setbacks with helplessness, which means that they behave as if there is nothing they can do to solve the problem: They become upset and anxious, they give up and don't even try. They avoid challenges and don't want to try anything new or difficult. As a result, they don't learn very much.

These experiences undermine their confidence even more. Over time, by avoiding challenge and giving up when the going gets tough, they learn less and start to lose ground. Eventually, they not only *feel* less competent, they actually *become* objectively less competent. It is a vicious cycle.

What are the mindsets that underlie mastery and helpless orientations?

A researcher named Carol Dweck (Dweck, 2006) has done a lot of research on the kinds of mindsets that children (and adults) develop. She has argued that the experiences that we have in achievement contexts (like schools) communicate to us the meaning of "intelligence" or "smart-ness."

According to her work, people tend to develop one of two kinds of mindsets based on their cumulative history of experiences:

- **Fixed Mindset** (aka an *entity view* of intelligence). In this mindset, people view intelligence as an unchangeable thing (an entity). Each of us has a certain amount of ability or talent, and these traits are "fixed," meaning that they can't be expanded or improved. In this mindset, children are always trying to "measure up," and they worry about revealing how big (or small) their intelligence actually is. Such children never want to let anyone see when they don't understand something, so they don't ask questions. Mistakes and failures are to be avoided because they show how "dumb" you are, and having to exert extra effort means that you must not be as "naturally" smart. Since every low performance is considered a shameful failure, individuals with this view tend to prefer tasks that they can already do well and to avoid those where they might have to try hard, or where they might make mistakes.
- **Growth Mindset** (aka an *incremental view* of intelligence). In this mindset, people view intelligence and abilities as expandable with effort. There is no fixed amount of intelligence that people come with. Instead, there's just the level of competence we have currently attained. Everyone can always get "smarter," through effort, hard work, practice, and more effective strategies. In this view, effort expands the capacity to learn, and mistakes are an opportunity to learn even more. Such children do not need to worry about whether they "measure up;" they focus instead on figuring out how to take the next steps to improve their skills. Since "failure" is considered an opportunity to learn more, individuals with this view tend to prefer tasks that are challenging, even if it means they make mistakes at first, because that is how they will learn the most.

Why do mindsets matter?

Even throughout adulthood, mindsets profoundly affect your life and the way you approach the world. For example, they affect your goals, how you strive to achieve them, and your motivations for pursuing them. They also impact your definitions of success versus failure and your reactions to obstacles and challenges.

Learning Goals (associated with a growth mindset). For those with a learning orientation, the goal is to acquire/improve new skills and knowledge. In general, individuals who hold these views enjoy challenges, set high goals for themselves, exert high effort, and concentrate on the task at hand. When failure is encountered, they tend to view it as information about how they can improve their performance in the future rather than as an assault on their personal abilities. When dealing with obstacles, people with learning goals tend to respond with more determination and persistence, show less distress, and initiate more proactive patterns of action such as planning, studying, and practicing.

Performance Goals (associated with a fixed mindset). For those with a performance orientation, the goal is to gain approval from others (e.g., the teacher) by demonstrating one's high ability or hiding one's low ability. In general, individuals who hold these views often avoid challenge, set less specific goals for themselves, and are easily distracted. They tend to do just enough to get by and experience more self-derogatory thoughts. When dealing with these setbacks, people with performance goals tend to give up quickly, avoid help, ruminate on their failures, and give excuses for their performance.

Can mindsets be changed?

Absolutely! The key idea of a growth mindset is that we can develop our abiities through effort. Change doesn't happen over night, but beliefs and mindsets *can* slowly be changed. When you encounter challenge, what can be learned from it? If we can give up the desire to always appear to be "smart" and embrace the struggles and setbacks that are an essential part of the learning process (and teach our children/students to do so as well), we will be more likely to pursue more challenging and fulfilling goals, and to become more competent over time.

It's important to note that having a growth mindset doesn't mean you can never feel bad about things that have gone wrong. You can, for a little while. But, feeling bad does not need to keep you from taking the next, growth-minded steps of figuring out how to improve in the future and trying again.

How can I promote a growth mindset in my children or students?

Feedback from parents and teachers can play a big role in the development of children's beliefs about themselves. There is a lot of research about how to set up classrooms so that they promote "learning goals" and a growth mindset. Perhaps the most important thing is the mindset of the adult. If a teacher believes that children's abilities are fixed, then he or she focuses on meauring intelligence, sorting children accordingly, and offering different opportunities to each group. Parents who label their children as this is my "smart child" and this is my "artistic child" communicate to both of them that their fixed talents have been measured and that they should limit themselves to what they would be good at.

Adults can help by providing a wide range of learning opportunities (especially in areas that children aren't already good at), accompanied by lots of encouragement for effort, hard work, and practice. When children encounter setbacks, they can benefit from cooperative examination of their mistakes, supportive coaching, and suggestions about more effective strategies for learning. Even subtle things can make a difference: Praising a child for getting a perfect score on an exam can send a message about the importance of getting the correct answer the first time (associated with a fixed mindset), whereas praising their effort can emphasize the importance of developing and learning (associated with a growth mindset). Likewise, expressing sympathy at a low performance or encouraging children to drop an activity when they do not excel right away suggests that there is nothing they can do (associated with a fixed mindset), whereas mild irritation and support for continued practice can communicate the expectation that children can improve if they apply themselves (associated with a growth mindset).

Reflect on your own development (or the development of someone you know):

1. What tends to motivate you?
    - Getting a good grade?
    - Learning new things?
2. How do you feel when you make a mistake?
    - Like an idiot?
    - Like you are about to learn something?
3. How do you cope with obstacles and setbacks?
    - Do you give up?
    - Do you try harder the next time?
4. What are your beliefs about intelligence?
    - Is it fixed?

- Can it change with effort?

5. Can you influence your own development?

- In what ways could you be your own (positive or negative) social context?

Supplemental Materials

- This video illustrates Erikson's stage of Industry. It features a 9-year old girl in Minneapolis who makes and sells bracelets with the proceeds going to support building black businesses & those in need bc of covid-19.

> *One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=111#oembed-2*

- This video shows an 8-year-old child, nick-named Kid President, who inspires people to be industrious and contribute to a better world.
- This article discusses the unique challenges of navigating the U.S. school system for minoritized students whose families do not subscribe to the White, middle class culture socialized in most schools.

  Phelan, P., Davidson, A.L., & Cao, H.T. (1991). Students' multiple worlds: Negotiating the boundaries of family, peer, and school cultures. Anthropology & Education Quarterly, 22, 224-250.

- This article provides an overview of the history of research on children's mindsets, as told by one of the researchers who uncovered the concept.

  Dweck, C. S. (2017). The journey to children's mindsets—and beyond. *Child Development Perspectives*, 11(2), 139-144.

- This documentary by Shakti Butler explores the school-to-prison-pipeline and the impact of the criminal legal system on minoritized populations.

  https://www.world-trust.org/healing-justice

- This article discusses how harsh discipline school policies impact Black girls.

  Hines-Datiri, D., & Carter Andrews, D. J. (2017). The Effects of Zero Tolerance Policies on Black Girls. Urban Education, 0042085917690204. https://doi.org/10.1177/0042085917690204

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Puberty & Cognition

Adolescence is a period that begins with puberty and ends with the transition to adulthood (lasting approximately from ages 10–18). Physical changes associated with puberty are triggered by hormones. Changes happen at different rates in distinct parts of the brain and increase adolescents' propensity for risky behavior. Cognitive changes include improvements in complex and abstract thought. Adolescents' relationships with parents go through a period of redefinition in which adolescents become more autonomous. Peer relationships are important sources of support, but companionship during adolescence can also promote problem behaviors. Identity formation occurs as adolescents explore and commit to different roles and ideological positions. Because so much is happening in these years, psychologists have focused a great deal of attention on the period of adolescence.

Physical Development in Adolescence

Learning Objectives: Physical Development in Adolescence

- Identify physical transformations in adolescence.
- Describe the effects associated with early and late onset of puberty, and how they differ for boys and girls.
- Identify three major brain developments in adolescence.
- Explain the asynchrony in two of the brain developments and how it is responsible for certain adolescent behaviors.
- Explain why sleep is important for adolescents.

Puberty *is a period of rapid growth and sexual maturation.* These changes begin sometime between age eight and fourteen. Girls begin puberty at around ten years of age and boys begin approximately two years later. Pubertal changes take around three to four years to complete. Adolescents experience an overall physical growth spurt. *The growth proceeds from the extremities toward the torso. This is referred to as* **distal–proximal development**. First the hands grow, then the arms, and finally the torso. The overall physical growth spurt results in 10-11 inches of added height and 50 to 75 pounds of increased weight. The head begins to grow sometime after the feet have gone through their period of growth. Growth of the head is preceded by growth of the ears, nose, and lips. The difference in these patterns of growth result in adolescents appearing awkward and out-of-proportion. As the torso grows, so do the internal organs. The heart and lungs experience dramatic growth during this period.

During childhood, boys and girls are quite similar in height and weight. However, gender differences become apparent during adolescence. From approximately age ten to fourteen, the average girl is taller, but not heavier, than the average boy. After that, the average boy becomes both taller and heavier, although individual differences are certainly apparent. As adolescents physically mature, weight differences are more noteworthy than height differences. At eighteen years of

age, those that are heaviest weigh almost twice as much as the lightest, but the tallest teens are only about 10% taller than the shortest (Seifert, 2012).

Both height and weight can certainly be sensitive issues for some teenagers. Most modern societies, and the teenagers in them, tend to favor relatively short women and tall men, as well as a somewhat thin body build, especially for girls and women. Yet, neither socially preferred height nor thinness is the destiny for most individuals. Being overweight, in particular, has become a common, serious problem in modern society due to the prevalence of diets high in fat and lifestyles low in activity (Tartamella, Herscher, & Woolston, 2004). The educational system has, unfortunately, contributed to the problem as well by gradually restricting the number of physical education classes in the past two decades.

Average height and weight are also related somewhat to racial and ethnic background. In general, children of Asian background tend to be slightly shorter than children of European and North American background. The latter in turn tend to be shorter than children from African societies (Eveleth & Tanner, 1990). Body shape differs slightly as well, though the differences are not always visible until after puberty. Asian background youth tend to have arms and legs that are a bit short relative to their torsos, and African background youth tend to have relatively long arms and legs. The differences are only averages, as there are large individual differences as well.

Sexual Development

Typically, this spurt in physical growth is followed by the development of sexual maturity. Sexual changes are divided into two categories: Primary sexual characteristics and secondary sexual characteristics. **Primary sexual characteristics** *are changes in the reproductive organs.* For females, primary characteristics include growth of the uterus and **menarche** *or the first menstrual period.* The female gametes, which are stored in the ovaries, are present at birth, but are immature. Each ovary contains about 400,000 gametes, but only 500 will become mature eggs (Crooks & Baur, 2007). Beginning at puberty, one ovum ripens and is released about every 28 days during the menstrual cycle. Stress and higher percentage of body fat can bring menstruation at younger ages. For males, this includes growth of the testes, penis, scrotum, and **spermarche** *or first ejaculation of semen.* This occurs between 11 and 15 years of age.

Figure 7.5. First time shaving

Secondary sexual characteristics *are visible physical changes that signal sexual maturity but are not directly linked to reproduction.* For females, breast development occurs around age 10, although full development takes several years. Hips broaden, and pubic and underarm hair develops and also becomes darker and coarser. For males this includes broader shoulders and a lower voice as the larynx grows. Hair becomes coarser and darker, and hair growth occurs in the pubic area, under the arms and on the face.

Effects of Pubertal Age. The age of puberty is getting younger for children throughout the world. According to Euling et al. (2008) data are sufficient to suggest a trend toward an earlier breast development onset and menarche in girls. A century ago the average age of a girl's first period in the United States and Europe was 16, while today it is around 13. Because there is no clear marker of puberty for boys, it is harder to determine if boys are also maturing earlier. In addition to better nutrition, less positive reasons associated with early puberty for girls include increased stress, obesity, and endocrine disrupting chemicals.

Cultural differences are noted with African American girls enter puberty the earliest. Hispanic girls start puberty the second earliest, while European-American girls rank third in their age of starting puberty, and Asian-American girls, on

average, develop last. Although African-American girls are typically the first to develop, they are less likely to experience negative consequences of early puberty when compared to European-American girls (Weir, 2016).

Research has demonstrated mental health problems linked to children who begin puberty earlier than their peers. For girls, early puberty is associated with depression, substance use, eating disorders, disruptive behavior disorders, and early sexual behavior (Graber, 2013). Early maturing girls demonstrate more anxiety and less confidence in their relationships with family and friends, and they compare themselves more negatively to their peers (Weir, 2016).

Problems with early puberty seem to be due to the mismatch between the child's appearance and the way she acts and thinks. Adults especially may assume the child is more capable than she actually is, and parents might grant more freedom than the child's age would indicate. For girls, the emphasis on physical attractiveness and sexuality is emphasized at puberty and they may lack effective coping strategies to deal with the attention they receive, especially from older boys.

Additionally, mental health problems are more likely to occur when the child is among the first in his or her peer group to develop. Because the preadolescent time is one of not wanting to appear different, early developing children stand out among their peer group and gravitate toward those who are older. For girls, this results in them interacting with older peers who engage in risky behaviors such as substance use and early sexual behavior (Weir, 2016).

Figure 7.6. Emotional functioning changes in puberty

Boys also see changes in their emotional functioning at puberty. According to Mendle, Harden, Brooks-Gunn, and Graber (2010), while most boys experienced a decrease in depressive symptoms during puberty, boys who began puberty earlier and exhibited a rapid tempo, or a fast rate of change, actually increased in depressive symptoms. The effects of pubertal tempo were stronger than those of pubertal timing, suggesting that rapid pubertal change in boys may be a more important risk factor than the timing of development. In a further study to better analyze the reasons for this change, Mendle, Harden, Brooks-Gunn and Graber (2012) found that both early maturing boys and rapidly maturing boys displayed decrements in the quality of their peer relationships as they moved into early adolescence, whereas boys with more typical timing and tempo development actually experienced improvements in peer relationships. The researchers concluded that the transition in peer relationships may be especially challenging for boys whose pubertal maturation differs significantly from those of others their age. Consequences for boys attaining early puberty were increased odds of cigarette, alcohol, or another drug use (Dudovitz, et al., 2015). However, from the outside, early maturing boys are also often perceived as well-adjusted, popular, and tend to hold leadership positions.

The Adolescent Brain

The brain undergoes dramatic changes during adolescence. Although it does not get larger, it matures by becoming more interconnected and specialized (Giedd, 2015). The myelination and development of connections between neurons continues. This results in an increase in the white matter of the brain that allows the adolescent to make significant improvements in their thinking and processing skills. Different brain areas become myelinated at different times. For example, the brain's language areas undergo myelination during the first 13 years. Completed insulation of the axons consolidates these language skills but makes it more difficult to learn a second language. With greater myelination, however, comes diminished plasticity as a myelin coating inhibits the growth of new connections (Dobbs, 2012).

Even as the connections between neurons are strengthened, synaptic pruning occurs more than during childhood as

the brain adapts to changes in the environment. This synaptic pruning causes the gray matter of the brain, or the cortex, to become thinner but more efficient (Dobbs, 2012). The corpus callosum, which connects the two hemispheres, continues to thicken allowing for stronger connections between brain areas. Additionally, the hippocampus becomes more strongly connected to the frontal lobes, allowing for greater integration of memory and experiences into our decision making.

The **limbic system**, *which regulates emotion and reward*, is linked to the hormonal changes that occur at puberty. The limbic system is also related to novelty seeking and a shift toward interacting with peers. In contrast, the **prefrontal cortex** *which is involved in the control of impulses, organization, planning, and making good decisions*, does not fully develop until the mid-20s. According to Giedd (2015), an important outcome of the early development of the limbic system combined with the later development of the prefrontal cortex is the "mismatch" in timing between the two. The approximately ten years that separate the development of these two brain areas can result in increases in risky behavior, poor decision making, and weak emotional control for the adolescent. When puberty begins earlier, this mismatch lasts even longer.

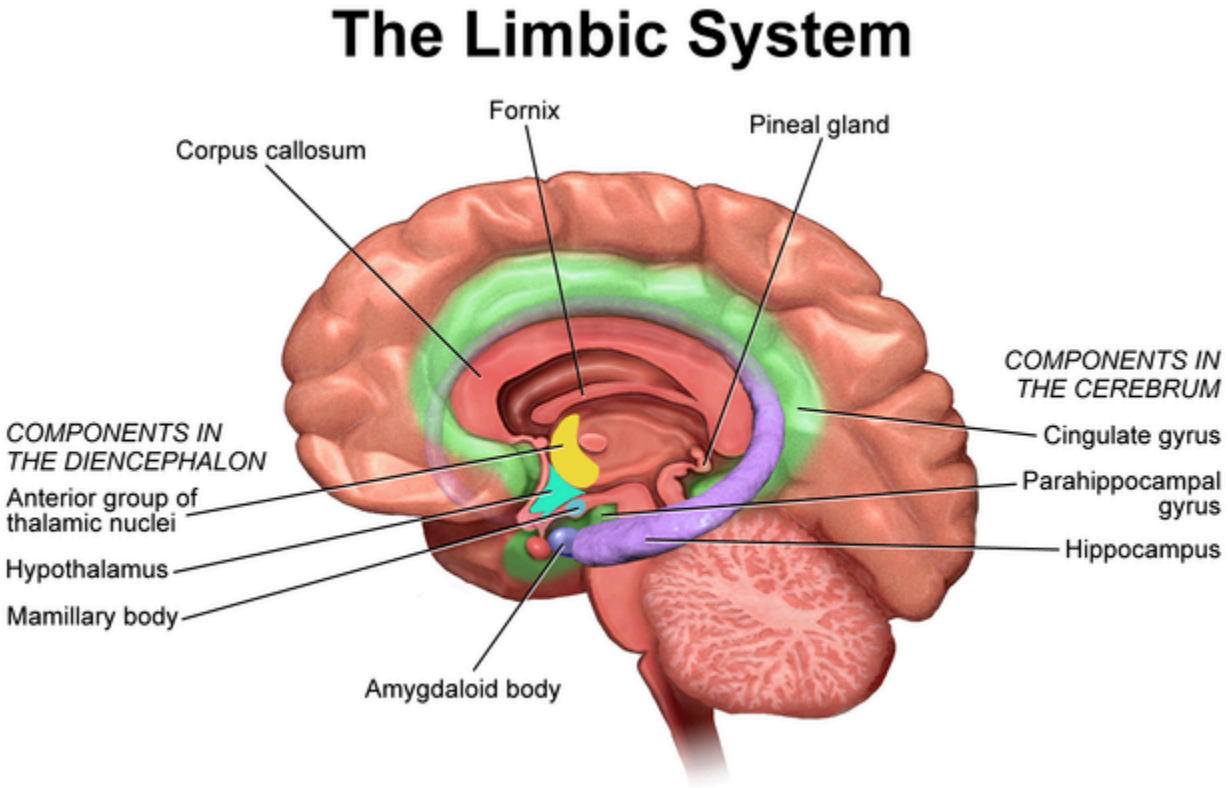

Figure 7.7. Blausen.com staff (2014). "Medical gallery of Blausen Medical 2014". WikiJournal of Medicine 1 (2). DOI:10.15347/wjm/2014.010. ISSN 2002-4436.

Teens typically take more risks than adults and according to research it is because they weigh risks and rewards differently than adults do (Dobbs, 2012). The brain's sensitivity to the neurotransmitter dopamine peaks during adolescence, and **dopamine** *is involved in reward circuits*, so adolescents may judge that the possible rewards outweigh the risks. Adolescents respond especially strongly to social rewards during activities, and they prefer the company of others their same age. Chein et al. (2011) found that peers sensitize brain regions associated with potential rewards. For example, adolescent drivers make more risky driving decisions when with friends to impress them, and teens are much

more likely to commit crimes together in comparison to adults (30 and older) who commit them alone (Steinberg et al., 2017). In addition to dopamine, the adolescent brain is affected by **oxytocin** *which facilitates bonding and makes social connections more rewarding*. With both dopamine and oxytocin engaged, it is no wonder that adolescents seek peers and excitement in their lives that could actually end up endangering them.

Because of all the changes that occur in the brain during adolescence, the chances for abnormal development, including the emergence of mental illness, also rise. In fact, 50% of all mental illnesses occur by the age 14 and 75% occur by age 24 (Giedd, 2015). Additionally, during this period of development the adolescent brain is especially vulnerable to damage from drug exposure. For example, repeated exposure to marijuana can affect cellular activity in the endocannabinoid system. Consequently, adolescents are more sensitive to the effects of repeated marijuana exposure (Weir, 2015).

However, researchers have also focused on the highly adaptive qualities of the adolescent brain which allow the adolescent to move away from the family towards the outside world (Dobbs, 2012; Giedd, 2015). Novelty seeking and risk taking can generate positive outcomes including meeting new people and seeking out new situations. Separating from the family and moving into new relationships and different experiences are actually quite adaptive– for adolescents and for society.

Optional Reading:
Social cognitive development during adolescence.
Suparna Choudhury, Sarah-Jayne Blakemore, Tony Charman *Social Cognitive and Affective Neuroscience*, Volume 1, Issue 3, December 2006, Pages 165–174, https://doi.org/10.1093/scan/nsl024

Adolescent Sleep

According to the National Sleep Foundation (NSF; 2016), to function their best, adolescents need about 8 to 10 hours of sleep each night. 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 slept only 7 ½ hours 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 the older adolescents, only about one in ten (9%) get an optimal amount of sleep, and those who don't are more likely to experience negative consequences the following day. These include depressed mood, feeling tired or sleepy, being cranky or irritable, falling asleep in school, and drinking caffeinated beverages (NSF, 2016). Additionally, sleep deprived adolescents are at greater risk for substance abuse, car crashes, poor academic performance, obesity, and a weakened immune system (Weintraub, 2016).

Troxel et al. (2019) found that insufficient sleep in adolescents is also a predictor of risky sexual behaviors. Reasons given for this include that those adolescents who stay out late, typically without parental supervision, are more likely to engage in a variety of risky behaviors, including risky sex, such as not using birth control or using substances before/during sex. An alternative explanation for risky sexual behavior is that the lack of sleep increases impulsivity while negatively affecting decision-making processes.

Figure 7.8. Adolescent circadian rhythms change

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 adolescent 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, it makes it difficult for them to wake up. When they are awakened too early, their brains do not function optimally. Impairments are noted in attention, academic achievement, and behavior while increases in tardiness and absenteeism are also seen.

To support adolescents' later circadian rhythms, the Centers for Disease Control and Prevention recommends that school begin no 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 start times, based on research demonstrating better student outcomes for later start times. More middle and high schools have changed their start times to better reflect the sleep research. However, the logistics of changing start times and bus schedules are proving too difficult for some schools, leaving many adolescent vulnerable to the negative consequences of sleep deprivation. Troxel et al. (2019) cautions that adolescents should find a middle ground between sleeping too little during the school week and too much during the weekends. Keeping consistent sleep schedules of too little sleep will result in sleep deprivation but oversleeping on weekends can affect the natural biological sleep cycle making it harder to sleep on weekdays

Cognitive Development in Adolescence

Learning Objectives: Cognitive Development in Adolescence

- Describe Piaget's formal operational stage and the characteristics of formal operational thought.
- Identify the advances and limitations of formal operational thought.
- Describe metacognition.
- Describe adolescent egocentrism.
- Describe the limitations of adolescent thinking.
- Explain the reason school transitions are difficult for adolescents.
- Describe the developmental mismatch between adolescent needs and school contexts.

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 at this period of life greatly influence one's future life and play a major role in character and personality formation.

Improvements in basic thinking abilities generally occur in several 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 then remains largely the same between late adolescence and adulthood.

Formal Operational Thought

In the last of the Piagetian stages, the young adolescent becomes able to reason not only about tangible objects and events, but also about hypothetical or abstract ones. Hence, it has the name formal operational stage—the period when the individual can "operate" on "forms" or representations. This allows an individual to think and reason with a wider perspective. This stage of cognitive development, which Piaget called ***formal operational thought***, marks a movement from an ability to think and reason from concrete visible events to an ability to think hypothetically and entertain what-if possibilities about the world. An individual can solve problems through abstract concepts and utilize hypothetical and deductive reasoning. Adolescents initially use trial and error to solve problems, but the ability to systematically solve a problem in a logical and methodical way emerges.

Hypothetical and Abstract Thinking

One of the major advances 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 provides the ability to plan ahead, see the future consequences of an action and to provide alternative explanations of events. It also makes adolescents more skilled debaters, as they can reason against a friend's or parent's position. Adolescents also develop a more sophisticated understanding of probability.

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, onto 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 school work: 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 cognitive developments—ones that focus more directly on the social and interpersonal issues of childhood and adolescence.

- *Propositional thought*. The appearance of more systematic, abstract thinking also allows adolescents to comprehend higher order abstract ideas, such as those inherent in puns, proverbs, metaphors, and analogies. Their increased facility permits them to appreciate the ways in which language can be used to convey multiple messages, such as satire, metaphor, and sarcasm. (Children younger than age nine often cannot comprehend sarcasm at all). This 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. This newfound ability also allows adolescents to take other's perspectives in more complex ways, and to be able to better think through others' points of view.
- *Metacognition*. Meta-cognition refers to "thinking about thinking." This often involves monitoring one's own cognitive activity during the thinking process. Adolescents are more aware of their own thought processes and can use mnemonic devices and other strategies to think and remember information more efficiently. Metacognition provides the ability to plan ahead, consider the future consequences of an action, and provide alternative explanations of events.
- *Relativism*. The capacity to consider multiple possibilities and perspectives often leads adolescents to the conclusion that nothing is absolute– everything appears to be relative. As a result, teens often start questioning everything that they had previously accepted– such as parent and family values, authority figures, religious practices, school rules, and political events. They may even start questioning things that took place when they were younger, like adoption or parental divorce. It is common for parents to feel that adolescents are just being argumentative, but this behavior signals a normal phase of cognitive development.

Adolescent Egocentrism

Adolescents' newfound meta-cognitive abilities also have an impact on their social cognition, as it results in increased introspection, self-consciousness, and intellectualization. Adolescents are much better able to understand that people do not have complete control over their mental activity. Being able to introspect may lead to forms of egocentrism, or self-focus, in adolescence. ***Adolescent egocentrism*** is a term that David Elkind used to describe the phenomenon of *adolescents' inability to distinguish between their perception of what others think about them and what people actually think in reality*. Elkind's theory on adolescent egocentrism is drawn from Piaget's theory on cognitive developmental stages, which argues that formal operations enable adolescents to construct imaginary situations and abstract thinking.

Accordingly, adolescents are able to conceptualize their own thoughts and conceive of other people's thoughts. However, Elkind pointed out that adolescents tend to focus mostly on their own perceptions, especially on their behaviors and appearance, because of the "physiological metamorphosis" they experience during this period. This leads to adolescents' belief that other people are as attentive to their behaviors and appearance as they are themselves (Elkind, 1967; Schwartz, P. D., Maynard, A. M., & Uzelac, S. M., 2008). According to Elkind, adolescent egocentrism results in two distinct problems in thinking: the imaginary audience and the personal fable. These likely peak at age fifteen, along with self-consciousness in general.

Imaginary audience is a term that Elkind used to describe the phenomenon that an adolescent *anticipates the reactions of other people to him/herself in actual or impending social situations*. Elkind argued that this kind of anticipation could be explained by the adolescent's conviction that others are as admiring or as critical of them as they are of themselves. As a result, an audience is created, as the adolescent believes that he or she will be the focus of attention. However, more often than not the audience is imaginary because in actual social situations individuals are not usually the sole focus of public attention. Elkind believed that the construction of imaginary audiences would partially account for a wide variety of typical adolescent behaviors and experiences; and imaginary audiences played a role in the self-consciousness that emerges in early adolescence. However, since the audience is usually the adolescent's own construction, it is privy to his or her own knowledge of him/herself. According to Elkind, the notion of imaginary audience helps to explain why adolescents usually seek privacy and feel reluctant to reveal themselves–it is a reaction to the feeling that one is always on stage and constantly under the critical scrutiny of others.

Elkind also suggested that adolescents have another complex set of beliefs: They are convinced that their own feelings are unique and they are special and immortal. ***Personal fable*** is the term Elkind used to describe this notion, which is the complement of the construction of an imaginary audience. Since an adolescent usually fails to differentiate their own perceptions and those of others, they tend to believe that they are of importance to so many people (the imaginary audiences) that they come to regard their feelings as something special and unique. They may feel that they are the only ones who 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 invincibility, especially to death.

This adolescent belief in personal uniqueness and invincibility becomes an illusion that they can be above some of the rules, constraints, and laws that apply to other people; even consequences such as death (called the ***invincibility fable***). This belief that one is invincible removes any impulse to control one's behavior (Lin, 2016). Therefore, adolescents will engage in risky behaviors, such as drinking and driving or unprotected sex, and feel they will not suffer any negative consequences.

Intuitive and Analytic Thinking

Piaget emphasized the sequence of cognitive developments that unfold in 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 d*eliberate, conscious, and rational (logical)*. Although these systems interact, they are distinguishable (Kuhn, 2013). Intuitive thought is easier, quicker, and more commonly used in everyday life. The discrepancy between the maturation of the limbic system and the prefrontal cortex, as discussed in the section on adolescent brain development earlier in this module, may make teens more prone to emotional intuitive thinking than adults.

As adolescents develop, they gain in logic/analytic thinking ability but may sometimes regress, with social context, education, and experiences becoming major influences. Simply put, being "smarter" as measured by an intelligence test does not advance or anchor cognition as much as having more experience, in school and in life (Klaczynski & Felmban, 2014).

Risk-taking

Because most injuries sustained by adolescents are related to risky behavior (alcohol consumption and drug use, reckless or distracted driving, and unprotected sex), a great deal of research has been conducted to examine the cognitive and emotional processes underlying adolescent risk-taking. In addressing this issue, it is important to distinguish three facets of these questions: (1) whether adolescents are more likely to engage in risky behaviors (prevalence), (2) whether they make risk-related decisions similarly or differently than adults (cognitive processing perspective), or (3) whether they use the same processes but weigh facets differently and thus arrive at different conclusions. 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. Adolescents value social warmth and friendship, and their hormones and brains are more attuned to those values than to a consideration of long-term consequences (Crone & Dahl, 2012).

Some have argued that there may be evolutionary benefits to an increased propensity for risk-taking in adolescence. For example, without a willingness to take risks, teenagers would not have the motivation or confidence necessary to leave their family of origin. In addition, from a population perspective, is an advantage to having a group of individuals willing to take more risks and try new methods, counterbalancing the more conservative elements typical of the received knowledge held by older adults.

Education in Adolescence

Adolescents spend more waking time in school than in any other context (Eccles & Roeser, 2011). Secondary education 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 differ biologically, cognitively and emotionally and definitely have different needs.

Figure 7.9. Middle school transition involves new freedom, responsibility, and social pressure.

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 as well (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.

Regardless of a student's gender or ethnicity, middle school can be challenging. Although young adolescents seem to desire independence, they also need protection, security, and structure (Brighton, 2007). Baly, Cornell, and Lovegrove (2014) found that bullying increases in middle school, particularly in the first year. Just when egocentrism is at its height, students are worried about being thrown into an environment of independence and responsibility. Additionally, unlike elementary school, concerns arise regarding structural changes– students typically go from having one primary teacher in elementary school to multiple different teachers during middle school. 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 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 costs and benefits to this use (Coyne et al., 2018).

Stage-environment Fit. A useful perspective that explains much of the difficulty faced by early adolescents in middle school, and the declines found in classroom engagement and academic achievement, is ***stage-environment fit theory*** (Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan, & MacIver, 1993). This theory highlights the developmental mismatch between the needs of adolescents and the characteristics of the middle school context. At the same time that teens are developing greater needs for cognitive challenges, autonomy, independence, and stronger relationships outside the family, schools are becoming more rigid, controlling, and unstimulating. The middle school environment is experienced as less supportive than elementary school, with multiple teachers and less closeness and warmth in teacher-student relationships. Disciplinary concerns can make classrooms more controlling, while standardized testing and organizational constraints make curriculum more uniform, and less challenging and interesting. Existing relationships with peers are often disrupted and students find themselves in a larger and more complex social context. This poor fit between the needs of students at certain stages and their school contexts is more pronounced over school transitions, but continues all throughout secondary education.

As adolescents enter into 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 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 percent 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 completing 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.

Academic achievement during adolescence is predicted by factors that are interpersonal (e.g., parental engagement in adolescents' education), intrapersonal (e.g., intrinsic motivation), and institutional (e.g., school quality). 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.

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Identity Development during Adolescence

Social and Emotional Development during Adolescence

Learning Objectives: Social and Emotional Development in Adolescence

- Summarize the primary psychosocial task of adolescence – identity versus role confusion.
- What are the four identity statuses Marcia posits?
- In what domains does identity development take place?
- What is the nature of the typical parent-teen relationship during adolescence?
    - Discuss the importance of autonomy and attachment in parent-teen relationships.
- Explain the importance of peers in adolescence.

Developmental Task of Adolescence: Identity vs. Role Confusion

Erikson believed that the primary psychosocial task of adolescence was establishing an **identity**. As formal operational thinking unfolds, bringing with it adolescent self-consciousness and the ability to reflect on one's own attributes and behaviors, teens often struggle with the question "Who am I?" This 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 uncertainty, confusion, exploration, experimentation, and learning regarding identity and one's life path. Erikson suggested that most adolescents experience **psychological moratorium**, *where teens put on hold commitment to an identity while exploring their options*. The culmination of this exploration is a more coherent view of oneself. Those who are unsuccessful at resolving this stage may either withdraw further into social isolation or become lost in the crowd. However, more recent research, suggests that few leave the adolescent period with identity achievement, and that for most of us the process of identity formation continues all during the years of emerging and young adulthood (Côtè, 2006).

Exploration and commitment. Expanding on Erikson's theory, James Marcia (2010) identified two key processes of identity development: **exploration** and **commitment**. By **exploration**, he meant *the processes though which youth imagine, consider, try out, and try on different possible facets of their identity*, experimenting with a variety of attitudes, looks, activities, friends, school subjects, and hobbies. If you happen to have photos of yourself at ages 13, 14, 15, and 16, you may see some pretty big changes in the way you were dressing and acting at those ages. Those different "personas" you were trying on, that would be a process of exploration. Exploration of different facets of identity may also be staggered over the adolescent, emerging adulthood, and early adult years (and beyond) as you initially work on appearance, attitude, and friendships, and then move on to romantic relationships and vocation. **Commitment** refers to a *consolidation and acceptance of who you truly are*, as you begin to recognize, understand, and feel comfortable with your multi-faceted authentic self, both in its individual facets (e.g., of personality, sexual orientation, ethnic/racial, gender identity, and so on) and in an overall picture of how each of those dimensions of identity fit together,

complement each other, and are integrated (e.g., how your sexual orientation fits with your religious beliefs). You can see why the process of **commitment** is an ongoing work in progress for so many years!

Marcia identified four identity statuses that represent the four possible combinations of the dimensions of commitment and exploration (see Table 7.3). You can think of them as snapshots of where adolescents and young adults are in the identity development process at any given moment.

Table 7.3 Marcia's Four Identity Statuses

	Exploration		
Commitment to an identity		**Absent**	**Present**
	Absent	Identity Diffusion	Identity Moratorium
	Present	Identity Foreclosure	Identity Achievement

adapted from Lally & Valentine-French, 2019

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 their options, nor made a commitment to an identity.* Those who persist in this identity throughout adolescence and young adulthood have basically not taken on the crucial developmental task of grappling with who they are and who they want to become, so they run the risk of drifting aimlessly with little connection to those around them or having little sense of purpose in life.

Figure 7.10. Identity development

Those in **identity foreclosure** *have made a commitment to an identity without having explored the options.* Some parents may make these decisions for their children and do not grant their teen the opportunity to participate in these choices. In other instances, teens may strongly identify with parents and others in their life and wish to follow in their footsteps. The potential problems with foreclosure are twofold. On the one hand, without active exploration, the adolescent or young adult may have missed the opportunity to really get to know themselves– their passions, preferences, and interests in life. Without this information, they may make a commitment to a (vocational, sexual, political, etc.) identity that is not really a good fit for their true self. On the other hand, even if the identity to which they are committed is authentic, it is possible that, without active and intentional consideration of multiple alternatives, their commitment may not be as strong or durable.

Identity moratorium *is a status that describes those who are activity exploring in an attempt to construct an identity but have yet to make any commitment.* This can be an anxious and emotionally tense time as the adolescent experiments with different roles and explores various beliefs. Nothing is certain and there are many questions, but few answers. As discussed later, identity development is a highly social process, influenced by parents, extended family, peers, friends, classmates, teachers, coaches, mentors, social media, and societal messages. For many adolescents, aspects of their identity are not necessarily viewed as acceptable by these social partners. For example, an adolescent who has a passion for art and theatre is part of an extended family who expects her to go into medicine or business. Such mismatches between internal information about who you feel you really are and what the social world wants you to be can extend the period of moratorium for specific aspects of identity development, while the adolescent or young adult attempts to negotiate and reconcile these mismatches.

Identity achievement *refers to those who after exploration have made a commitment*. This is a long process and, as mentioned previously, is not typically achieved by the end of adolescence.

Changes in identity status. During high school and the college years, teens and young adults move from identity diffusion and foreclosure toward moratorium and achievement. The biggest gains in the development of identity typically take place in college, as college students are exposed to a greater variety of career choices, lifestyles, and beliefs. Exposure to so many alternatives is likely to spur 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). During these later periods, emerging adults also focus some of their energy in the task of identity development on achieving more **coherence** and **integration** among the different facets of one's identity, striving to fit passions (like music) into a vocation that will support them financially, or finding a balance between family, school, and work.

Even after an identity has been established, life events during adulthood and even into old age can reignite the process of identity development. For example, when a middle-aged man loses his job and it seems as if that line of work is being phased out, he may begin the process of reimagining a new vocational identity. Or when a middle-aged woman's children move out of the house, she may begin to rekindle the parts of her identity that were fascinated by creative writing or building a business. Retirement is a common time for couples to figure out who they want to be and what they want to do in the next chapter of their lives.

Because identity development can be considered an ongoing process that we revisit and re-examine at many times in our lives, researchers have given this process its own name: **MAMA cycling** or *moving back and forth between moratorium and achievement.* This cycling between exploration and achievement is common in identity formation (Grotevant, 1987) and considered a normal and healthy process of development.

What is Identity?

One of the fascinating things about human psychology is our ability to reflect on ourselves as objects of our own thinking. We have seen how this ability makes it possible, starting in early childhood, to have thoughts about the self and to develop a self-concept that includes the "I" self and the "Me" self. In adolescence, our thinking about ourselves begins to involve more abstract categories and characteristics. Identity occurs in multiple areas of our life. These domains include academic, religious, ethnic, and social identity. Identity encompasses our personal preferences and characteristics and our group memberships.

Identity has been described as the individual's answer to the question, "Who am I?" It has been depicted as a mental structure or representation of the self. But identity is only partially about who and what we are. It also includes what we do, what we like, and even how we feel. So identity is more than a mental model. It is full of meanings, emotions, desires, and goals. Identity is only partially stable, because it is also flexible across situations and malleable over time. Identity is somewhat like a thing and a lot like a process. It is our conceptualization of a network of associations and mental events that we use to think about and talk about ourselves and other people.

The multiple personal and social identities we hold play out in a variety of domains and situations in complex ways. One way in which we incorporate the social world into our views of ourselves is through our **positionality** in the social hierarchies in our society. This suggests that a useful approach to understanding this complexity and unraveling some of the interconnections is to examine identity in terms of the intersections between aspects of our positions, such as where we fall in terms of race, gender, and class

(Crenshaw, 1989; 1991). From this perspective, it is the **intersection** among our positions on these hierarchies (as well as others, such as immigrant and disability status, age, and so on) that influence our experiences (e.g., the conditions under which we live, the opportunities we enjoy, and how we are treated) as well as how we see ourselves (based in part on society's messages about our value). For example, the experiences of black women may be different in many ways from those of black men. And the experiences of rich black women will be different from those lower in socioeconomic status. These experiences involve overlapping and interacting systems of social structure and meaning, where layers of identity are not just additive or compounded, but instead create specific **niches** that are emergent and unique (as well as changing as society's prejudices and hierarchies shift). The **intersectionality** approach has been applied in research on identity processes, antecedents, and consequences, and has resulted in many fascinating and unexpected empirical findings.

Some researchers who study the self insist that it is not a fixed entity or trait at all, but instead a dynamic system that is held in place partly by our beliefs that it is real. From this perspective, a possible direction for identity development would be to "get over" or "transcend" the ego-centric idea of a unitary isolated self, and expand one's dynamic agentic presence to connect with other people, the natural world, and the past and future. What a mind-blowing idea!

Facets of Identity Development

Developmental psychologists have researched multiple different areas of identity development. Some of the main areas include:

- **Ethnic-Racial identity** *refers to how people come to terms with who they are based on their ethnic and/or racial ancestry.* "The task of ethnic identity formation involves sorting out and resolving positive and negative feelings and attitudes about one's own ethnic group and about other groups and identifying one's place in relation to both" (Phinney, 2006, p. 119). When groups differ in status in a culture, those from the non-dominant group are typically cognizant of the customs and values of those from the dominant culture. The reverse is rarely the case. This makes ethnic-racial identity far less salient for members of the dominant culture. In the United States, those of European ancestry engage in less exploration of ethnic-racial identity, than do those of non-European ancestry (Phinney, 1989). However, according to the U.S. Census (2012) more than 40% of Americans under the age of 18 are from ethnic and racial minorities. For many ethnic and racial minority teens, discovering one's ethnic-racial identity is an important part of identity formation.

Figure 7.11

- **Cultural/Bicultural/Multiracial Identity.** Ethnic minorities must wrestle with the question of how, and to what extent, they will identify with the culture of their family and with the dominant culture of the surrounding society. Phinney (2006) suggests that people may handle this negotiation in different ways. Some may keep these identities separate, others may combine them in some way, while others may reject some of them. **Bicultural identity** means *the individual sees himself or herself as part of both the ethnic minority group and the larger society*. Those who are **multiracial**, that is *whose parents come from two or more ethnic or racial groups*, have a more challenging task in current society. In some cases, their appearance may be ambiguous. This can lead to others constantly asking

them to categorize themselves. Phinney (2006) notes that the process of identity formation may start earlier and take longer to accomplish in those who are not mono-racial. For both multicultural and multiracial adolescents, the task of identity development is made more complicated by society's current difficulty in recognizing these identities as legitimate. Some adolescents are continually asked "No, which one are you *really*?" or are categorized according to their phenotypic appearance. Sometimes their identity is challenged if they do not embody the prototype of a category (e.g., are not fluent in their heritage language). Luckily, society is starting to shift in its understanding of multi-ethnic, -racial, and -cultural identities, as seen, for example, in questions about race/ethnicity, where people are allowed to "check all that apply" instead of being forced to select only one category.

> It is also important to note that those who do commit to an ethnic-racial identity may periodically reexamine the issues of race and ethnicity. It is especially common to do so when you have children, at which time you may reflect on the values, history, and traditions of your ethnic and racial heritage that you wish to pass on to your children. This cycling between exploration and achievement is common not only for racial and ethnic identity formation, but in other aspects of identity development (Grotevant, 1987) and as mentioned previously is referred to as **MAMA cycling** or *moving back and forth between moratorium and achievement.*

- **Gender identity:** Acquiring a 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 the lack of a gender binary allow adolescents more freedom to explore various aspects of gender. Some teens may foreclose on a gender identity as a way of dealing with this uncertainty, and they may adopt more stereotypic male or female roles (Sinclair & Carlsson, 2013). For youth who attend college, exposure to a wider variety of options and role models may allow them to re-open questions about their own gender identity, initiating further exploration and new commitments.
- **Sexual identity:** According to Carroll (2016), by age 14 most adolescents become interested in intimate relationships, and they may begin sexual experimentation. Many adolescent feel pressure to express interest in opposite-sex relationships, even if they are not ready to do so. This pressure can be especially stressful for those adolescents who are gay, lesbian, bisexual or questioning their sexual identity. Many non-heterosexual adolescents struggle with negative peer and family reactions during their exploration. A lack of parental acceptance can have especially adverse effects on the gay, lesbian or bisexual adolescent's emerging sexual identity, and can result in feelings of self-doubt, depression, and alienation. In cases where families are unsupportive, adolescents may seek support from online communities or wait until they leave home to work on this aspect of their identity. In contrast, adolescents whose families and peers support open exploration of their sexual identities have better psychological and mental health outcomes.
- **Vocational identity.** 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. Vocational 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. In addition, many of the jobs held by teens are not in occupations that most teens will seek as adults. Rapid changes in the nature of employment, and the fact that most adults will hold multiple jobs over their working lives, also suggest that this identity may be re-negotiated several times over the lifespan.
- **Religious identity.** Adolescence is a time when teens normatively question their participation in religious practices. At the same time, most teens end up adopting religious views that are 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 completely reject the religion of their families.
- **Political identity.** The political ideology of teens 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 parties but view themselves as more of an "independent." Their teenage children are

often following suit or become more apolitical (Côtè, 2006). Trends in voting among young adults suggest that most of them are questioning whether it is meaningful to participate in the current political system.

- **Negative Identity.** A **negative identity** *is the adoption of norms and values that are the opposite of one's family and culture*, and it is assumed to be one of the more problematic outcomes of identity development in young people (Hihara, Umemura, & Sigimura, 2019). Those with a negative identity hold dichotomous beliefs, and consequently divide the world into two categories (e.g., friend or foe, good or bad). Hihara et al. suggest that this may be because teens with a negative identity cannot integrate information and beliefs that exist in both their inner and outer world. In addition, those with a negative identity are generally hostile and cynical toward society, often because they do not trust the world around them. These beliefs may lead teens to engage in delinquent and criminal behavior and prevent them from engaging in more positive prosocial acts that could be beneficial to society

Developmental Processes in the Task of Identity Formation

As we discussed in the class on gender identity, all these features of identity have their start in early childhood, as children are taught to make distinctions among identity-relevant categories (e.g., male vs. female or Black vs. Latinx) and then locate themselves among those categories. During early childhood, these processes, sometimes called **identification**, are largely declarative and descriptive, as children figure out who belongs to which "club" and the concrete differences in club members' appearance, behaviors, activities, and equipment (e.g., toys, games). Although children notice differences in valence, status, and privileges, it is as if youngsters are just taking notes and not necessarily reflecting on or evaluating the categories to which they have been assigned or the differences in treatment they observe and experience.

However, as the cognitive developments of formal operations begin to emerge during adolescence, thinking becomes more abstract, psychological, complex, and integrated. With increased skills at perspective taking, adolescents are more able to see themselves through the eyes of imagined others, which also makes them more self-aware, self-conscious, self-evaluative, and prone to social comparison. It is as if, during the shift to formal operations, adolescents "wake up" to these features and categories of identity, and how they are viewed in society. This newfound awareness imbues them with deeply personal meaning, value, and emotion. Depending on the messages that children and adolescents have received about their attributes and the categories to which they belong, the process of negotiating an identity can be more or less complex and rocky.

Although the development of an identity of one's own seems like a very personal and private task, it is also highly ***social***, shaped as much by external and interpersonal factors as it is by internal intrapersonal ones. In fact, we can say that this task is negotiated at the **nexus** between internal and external forces. Internally, adolescents have access to their history of interests, preferences, impulses, proclivities, temperament, and intrinsic motivations, in other words, all the interactions that provide them with information about the nature of their genuine and authentic self. These experiences are now evaluated more analytically and translated into psychological constructs, like personality traits or values, that are nominated for inclusion into a personal identity. At the same time, this information, much of which is based on **social** interactions and experiences, is filtered through the lens of the messages adolescents receive about the salience and value of these attributes and identity categories. Society even has opinions about what categories are available for use in constructing identities, for example, as mentioned previously, society is only just catching up with categories like multiracial or multicultural, and multiple genders and sexualities. Close relationships, including relationships with parents, siblings, and other family members, play a major role and as children approach and go through adolescence, peers, friends, and classmates play increasingly important roles as well.

Strands of identity development. The task of identity development is complex because it involves the integration of three different strands.

1. First, adolescents are seeking an identity that is **authentic**, that is, that reflects their true and genuine self. From this perspective, their identity needs to correspond with information they are receiving about themselves from

deep temperamental, emotional, and motivational processes– what they like (to do, play, learn about, read, etc.), how they spontaneously react to various situations, their interests and passions, their gifts and faults. To be satisfying, a personal identity needs to be anchored in what is real and true about an adolescent's individuality. This first strand could be labeled "Who I discover myself to be," with the goal of "To thine own self be true."

How Do I Know What My "Authentic Self" Really Is?

It is not easy to come to know our true selves. By the time we start thinking about these questions in adolescence, we already have many years and hundreds of thousands of experiences incorporated into our multi-faceted view of who we are. These include information from our true selves, but they are wrapped in layers of messages and social evaluations we have experienced and observed.

When people wonder about the nature of their "real" and "true" self, researchers sometimes send them back to photos and memories of their 10-year-old selves. At that age, many of our actual characteristics and interests are at the surface, because we have not yet developed the self-consciousness that tells us to hide features of who we really are in order to fit in. As adults are doing identity work, they can sometimes be aided by photos of their 10-year-old selves, often fully and unself-consciously expressing a range of opinions, interests, and identities, and bursting with confidence. Photos and memories of that time period can serve as guides about what it might mean to be truly authentic.

Other people can "get in touch with themselves" through creative acts, like journaling about your thoughts and feelings, expressing yourself by writing songs or short stories, painting, reading or improvisational theatre. Another interesting activity is the illustrated discovery journal, where you just find photos, drawings, poems, or sayings that speak to you, and put them into a collage, journal, or sketchbook. These images and words, collected for no reason other than you like them, can provide windows that help you get to know yourself better.

Other people get to know themselves through activities. They look for ways to be involved in the world that seem fun and meaningful, like gardening, building houses for Habitat for Humanity, dropping into the community center and taking a class, or volunteering somewhere. The most important aspect here is to look at options until you find something that resonates– something you really want to do. That impulse saying, "Wow, that would be fun, I *really* want to do that," can be seen as a message from your true self. And don't worry, since your true self is developing too, you will have plenty of time to get re-acquainted over and over again!

2. At the same time however, there is a second strand, now available to adolescents through their new-found perspective-taking skills. This set of processes is based on social desirability and acceptance– what others (real and imagined) think about me, my personality, appearance, interests, and societal categories (gender, sexual orientation, race and ethnicity, class, and so on). This strand involves adolescents coming to grips with the societal messages that they have already learned about these various attributes and categories. Up to now, the catalogues of social evaluations children have experienced and observed have been understood as largely descriptive (e.g., society likes their girls pretty and their boys strong), but now they are becoming deeply personal and meaningful– "Am I pretty enough?" "Am I strong enough?" Adolescents are tasked with constructing an identity that is socially acceptable, one that family, friends, classmates, teachers, online communities, and society at large will validate as "good." If the first strand is labeled, "Who I think I am," then this second strand can be called, "Who others think I am" or more precisely, "Who I think others think I am."
3. The third strand of identity is kind of a "35,000-foot view" of both of these strands and how they fit together. It

consists of a summative personal and social evaluation of this whole identity that the adolescent has put together– "Do I feel good about myself?" You can see how these three strands can be in tension or conflict, and how fitting them together might require some active negotiation. This is especially true when authentic characteristics of children (like their sexual orientation, appearance, ethnic background, disability status, or grand passions) are stigmatized, devalued, or evaluated by society as "less than," or even dismissed as non-existent (e.g., gender fluidity or transgender identities). Adolescents are faced with an impossible choice: They can either be true to themselves or create an identity that is socially valued. Initially it seems that all the options here are problematic. Adolescents can deny or dismiss the parts of themselves that society devalues, leading to a socially-acceptable identity that, from the adolescents' internal perspective feels hollow or fake. Unsatisfying and inauthentic. Or they can be true to themselves, accept society's judgements about people like themselves, and conclude that this self they have been handed is authentic but inferior. In this case, we can say that adolescents have internalized the stigma and biases imposed by families, friends, or society in general.

However, there are other options for healthy identity development. For adolescents to successfully negotiate these dilemmas, they need local social contexts that believe and communicate messages that are very different from the ones broadcast by society more generally. These are messages such as "girl power," the treasure of racial and ethnic heritage and tradition, LGBTQ+ pride, disability rights, and the inherent value and worth of all people. Parents and families play key roles in these efforts, by providing racial and ethnic (gender, sexual, religious, disability, etc.) socialization that counteracts biased messages, instills pride, and teaches children about histories of struggle against unjust treatment and discriminatory social narratives. Such socialization allows youth to externalize harmful societal messages, and come to view these characteristics as badges of honor, motivating them to affiliate with similar others and to participate in social justice movements. When families of origin are not supportive, young adults often create their own "families of choice" when they leave home. These families can include older adult mentors and role models, peers and close friends who adore them for exactly who they are, and younger adolescents whom they can mentor through processes of identity development. You can see why social contexts are such integral parts of identity development.

Social Factors in the Development of Identity

To provide a framework for thinking about social factors, we can turn to **contextualist** views, like Bronfenbrenner's bioecological model and Spencer's phenomenological variant of ecological systems theory. These models remind us that ecologies are complex and multi-layered. We can begin by considering the important role of microsystems, like families, peer groups, and schools. But we should also consider mesosystem forces, and especially, factors from macrosystems that are structured according to societal status hierarchies, such as those based on race and ethnicity, class, and gender. We will review some general information about the crucial roles of parents, peers, and schools. And then consider in more detail the development of ethnic and racial identity, where the best research has been conducted to date on the role of societal status hierarchies. This body of research is relatively recent, because developmentalists, who were largely white, did not recognize the centrality of ethnic-racial identity development. We conclude with some thoughts on ethnic-racial identity in white adolescents, about which not much is currently known.

Parents. Much of the research on social influences on identity development focuses on caregivers. When all goes well, caregivers are the ones who can, starting with attachment processes, communicate warmth, affection, and unconditional love. They get to know a child's inborn temperament, come to value them as complex interesting individuals, and find ways to provide a good match to their idiosyncrasies and quirks. Through emotion coaching, they help children develop the vocabulary to talk about their genuine feelings and desires, and work with them to develop strategies for seeing that their own needs are considered while also considering the needs of others. They provide role models and offer young children opportunities to play, explore their favorite activities, and follow their own interests.

Using the idea of the "styles of parenting," we can see that adolescents whose parents employ a largely **authoritative parenting style**, will likely have an easier time with the tasks of identity development. These adolescents have generally

received strong messages of love and support for their genuine selves, while also learning how to follow true moral rules and act with kindness, honesty, and responsibility. The role of autonomy support is equally important, as adolescents are given both freedom and parental support when they explore different facets of their personal identities.

It is also clear that other kinds of parenting may contribute to a rockier process of identity development. Parents who are more **authoritarian**, and do not allow deviation from rigid standards can make it more difficult for children to participate in the exploratory processes that are so central to this task. Strong negative views of particular identities (e.g., sexual orientation, gender, political views) can throw up roadblocks to the adolescent's authentic self. You can imagine that this style of parenting could lead to premature foreclosure when the adolescent just submits to parental wishes, or moratorium when youth get stuck in committing to an identity they cannot really endorse. Or even rebellion, when adolescents then lose some of the close connections with family that can provide them support during this process.

So called "**helicopter**" parents, who prevent children from taking risks and trying out new things, likewise curtail independence and exploratory activities, thus interfering with key processes of identity development. There are parts of **permissive or indulgent** parenting that may seem like they could facilitate identity development (e.g., warmth, love, and a philosophy of "anything goes") by encouraging children to do whatever feels right to them. However, as we discussed in the lectures on parenting, limits are good for children. Firm and reasonable limits help children learn to get along with others and respect others' rights. Children with permissive parents tend toward immaturity, self-centeredness, and lack of achievement and mastery. These attributes can interfere with the adolescent's eventual decisions to commit to values, activities, and relationships that are important parts of identity development.

Finally, **neglectful** caregivers, who basically ignore children, undermine the development of the security, self-confidence, and self-knowledge adolescents will need to make good decisions about who they are and who they want to become. Sometimes this history can leave adolescents wandering in "identity diffusion" where they are somewhat aimless and do not really take ownership for the next steps in their life.

Peers. Much has been made about the importance of peers to processes of identity development, and for good reason. Relationships with friends and with members of peer groups are an important context for the development of identity during adolescence. Communication and interactions with peers provide opportunities to elaborate on possibilities, play out tentative exploration, and test commitments against others' perspectives. Friendships and peer groups can be safe contexts for exploration, made up of freely chosen and mutually supportive equals.

Peers are important to all three strands of identity development. In the first strand, the process of self-discovery, adolescents communicate honestly with each other within these relationships. By giving and receiving information, they become more aware of the diversity of characteristics, preferences, and viewpoints found among their agemates. Through this communication, they develop clarity about their own characteristics and get a better sense of who they are. Research has found that adolescents who have higher quality peer relationships, who interact more frequently with their peers, and are more involved in activities with agemates also experience greater identity development and commitment.

In the second strand, as a local social context of being seen, heard, and responded to by others, peer relationships are crucial sources of recognition, validation, and support for autonomy, as well as feedback about social desirability of attributes and preferences. Through processes of mirroring and social comparison, adolescents become aware of both similarities and differences to their own friends and peer groups, and with other agemates. There is a desire to bond with like others and to find affinities, but this does not necessarily lead to blind conformity. Adolescents also embrace ways in which they are individually distinctive. They have a desire to be unique. The dynamic tension between similarity and individuality varies between individuals and changes across development. Most teens seek, to some extent, both to fit in and to stand out. Early adolescents are usually more susceptible to peer influence and conformity, while later

in adolescence distinctiveness tends to be more highly valued, even within relationships primarily based on affinity or similarity.

In the third strand of identity development, at the societal level of factors and processes that affect identity development, peers also play a part. Adolescents share their perspectives and react to societal norms, values, lifestyle choices, and social hierarchies within their peer relationships. These interactions affect identity development by helping teens clarify their own beliefs and preferences. Peers can also be agents for the impact of negative social forces, when they express stigma, prejudice, or discrimination. This can come from other non-affiliated agemates in the social context, and sometimes even from within an individual's own group.

As it has been in relationships with parents, **identification** is also a process at work in adolescent peer relationships, and it contributes to identity formation. Identification involves *being drawn to and seeing your potential self in admired others, and then emulating their behaviors and characteristics*. A good friend or popular peer group member, for example, may serve as a role model. In connection with the burgeoning importance of social aspects of life at this age, adolescent identity development also involves **social identification**, *the valuing and adoption of group behaviors and group characteristics.* Teens often adopt the dress, slang, mannerisms, attitudes, and activities of a **crowd**, which is a *larger group or social category* within their school context, or they may jointly emulate values and behaviors from a segment of popular culture.

Schools. Although we talk more about schools in the section on education, it is important to emphasize here that, although schools may not always think of themselves as important socializers of identity, they nevertheless play key roles in identity construction. They provide experiences, interaction partners, and messages to children about their academic identities (e.g., how smart they are), interests (e.g., writing, robotics, math, music), and vocational identities (whether they are college bound or able to hold certain jobs). These experiences happen in and out of class, with teachers and classmates, and include after school, extra-curricular, and recreational activities. Schools can facilitate identity development when they offer rich and varied opportunities for exploration that expose children to different communities of learners and do-ers (e.g., community organizers, professionals, scientists, gardeners, plumbers, child-care workers, creative artists). Especially meaningful are extra-curricular activities with real responsibilities and opportunities to take leadership roles.

Middle and high school can be tricky places for the healthy development of all students, but they can be especially problematic for adolescents who do not meet all the narrow societal "norms" endorsed by status hierarchies. Parents and educators are often horrified at the vicious social messages that come from adolescents and target other adolescents who are perceived to be lower on social status hierarchies. However, if you wonder where adolescents get their ammunition, adults should examine the higher-order hierarchies of human worth that are currently endorsed by the larger society at this historical moment. Adolescents may be the "police" who enforce these rigid values, but they are enabled and trained by society at large. It is not an accident that adolescence is a time during which youth start to actively question and sometimes reject the social messages that society prescribes about the value, status, and privileges associated with particular personality characteristics, activities, physical appearances, and status categories.

For many parents, their goals are to get their adolescents out of these school contexts as soon as possible, to protect them from experiences of bullying and peer discrimination, and to find alternative more supportive subcultures for them in other settings (like creative arts centers or workplaces). For some students, online communities allow them to find like-minded friends and peers, and adults also create social messages, such as the "It gets better" campaign aimed at LGBTQ+ youth. The importance of "schools" continues on after high school, since universities often provide a wide range of role models and opportunities for students to explore and engage in identity development activities. Students who attend rigid narrow high schools are often astonished at the freedoms they find at college, where they can discover and explore many facets of their identities through friendships, clubs, and classes. Especially important, they can seek out and choose their own "family" of adults (teachers, advisors, mentors, etc.) and peers, who encourage them to be themselves and love them for exactly who they are.

To continue up the layers of social contexts, we turn to the **higher-order contexts** we have been discussing throughout this class. One area in which a great deal of important theorizing and research has been conducted focuses on a specific aspect of identity, namely, the development of ***ethnic-racial identity*** during adolescence and emerging adulthood.

Structural Racism and the Study of Ethnic-Racial Identity

The study of ethnic-racial identity within the field of developmental psychology has undergone a series of transformations in response to a growing awareness of the social-structural and historical contexts and related challenges adolescents face in negotiating this task. Several perspectives have emerged, with each providing unique insights and generating relevant empirical findings. Three major contributions are: (1) Phinney's model of **ethnic identity formation** (Phinney, 1990), based on Marcia's developmental process dimensions of exploration and commitment; (2) **extended bioecological models** inspired by Bronfenbrenner, including Spencer's **PVEST** (Phenomenological Variant of Ecological Systems Theory), and Garcia Coll and colleagues' **Integrative Model for the Study of Developmental Competencies in Minority Children**; and (3) **multidimensional conceptualizations**, which focus on the content and structure of ethnic-racial identity. An overview of each of these approaches follows. Additional information is available in the supplemental readings given at the end of the chapter.

Phinney's model of ethnic identity formation is based on Erikson's and Marcia's model of identity formation (Phinney, 1990; Syed & Juang, 2014). Through process of exploration and commitment, individuals come to understand and create an ethnic identity. Phinney suggests three stages or statuses with regard to ethnic identity:

1. **Unexamined Ethnic Identity.** Adolescents and adults who have not been exposed to ethnic identity issues may be in the first stage, unexamined ethnic identity. This is often characterized by a default preference for the dominant culture, or where the individual has given little thought to the question of their ethnic or cultural heritage. This is similar to *diffusion* in Marcia's model of identity. Included in this group are also those who have adopted the ethnicity of their parents and other family members with little thought about the issues themselves, similar to Marcia's *foreclosure* status (Phinney, 1990).
2. **Ethnic Identity Search.** Adolescents and adults who are exploring the customs, culture, and history of their ethnic group are in the ethnic identity search stage, similar to Marcia's moratorium status (Phinney, 1990). Often some event "awakens" a teen or adult to their ethnic group: perhaps a personal experience with prejudice, a highly profiled case in the media, or even a more positive event that highlights the contributions of someone from the individual's ethnic group. Teens and adults in this stage will immerse themselves in their ethnic culture. For some, "it may lead to a rejection of the values of the dominant culture" (Phinney, 1990, p. 503).
3. **Achieved Ethnic Identity.** Those who have actively explored their culture are likely to have a deeper appreciation and understanding of their ethnic heritage, resulting in progress toward an achieved ethnic identity (Phinney, 1990). An achieved ethnic identity does not necessarily imply that the individual is highly involved in the customs and values of their ethnic culture. One can be confident in their ethnic identity without wanting to maintain the language or other customs. The development of ethnic identity takes time, with about 25% of youth from ethnic minority backgrounds having explored and resolved these issues by tenth grade (Phinney, 1989). The more ethnically homogeneous the high school, the less adolescents explore and achieve an ethnic identity (Umana-Taylor, 2003). Moreover, even in more ethnically diverse high schools, teens tend to spend more time with their own group, reducing exposure to other ethnicities. This may explain why, for many, college becomes the time of ethnic identity exploration. "[The] transition to college may serve as a consciousness-raising experience that triggers exploration" (Syed & Azmitia, 2009, p. 618). Colleges can facilitate this process by requiring ethnic studies courses as part of their core curricula, and by supporting ethnic studies programs and student centers organized around ethnic affiliation.

Extended bioecological systems models, inspired by Bronfenbrenner**.** There are two of these models, the first being the **Phenomenological Variant of Ecological Systems Theory (PVEST)**, developed by Margaret Beale Spencer (2006). PVSET

is an identity-focused developmental theory that situates identity formation within the social context, where risk and protective factors act as supports or stressors and create individual vulnerability, based on social position and personal experiences, as well as culture. Individuals play an active role in coping with their perceptions and vulnerability and forming identities that make sense in response to their experiences. PVEST is a model of overlapping and interacting systems. PVEST includes the role of individual experiences and perceptions and active responses and sense-making, and the reciprocal effects of the individual on their context and future experiences.

The **Integrated Model** of Garcia-Coll and colleagues incorporates the social and contextual factors of position and structure, risk and promotion, and emphasizes the role of adaptive cultures and the family context, as well as individual child characteristics, in the production of various competencies as positive developmental outcomes for minoritized children and youth (García Coll, Lamberty, Jenkins, McAdoo, Crnic, Wasik, & Garcia, 1996). The Integrated Model includes ethnic-racial identity as both a component of adaptive cultures and as an important positive outcome of development. A large body of research over several decades has applied these extended bioecological models to the study of marginalized, minority, and immigrant youth, and produced solid empirical evidence of the importance of contextual factors and individual responses, as well as evidence of the benefits of strong ethnic-racial socialization and identity (Hughes, Watford, & Del Toro, 2016).

Multidimensional conceptualizations of ethnic-racial identity have their roots in attempts to create scales to measure ethnic-racial identity. A productive approach has been the five dimensions described by Sellers and colleagues, who developed a questionnaire measure of Black racial identity for use in studies of antecedents, consequences, and optimizing social programs and interventions (Sellers, Smith, Shelton, Rowley, & Chavous, 1998). This approach focuses on the structure and content, rather than on the development of ethnic-racial identity. The five dimensions described by Sellers and colleagues are:

1. ***Centrality*** or the importance of ethnic-racial identity to self-definition;
2. ***Salience*** or importance of ethnic-racial identity in the situation;
3. ***Public regard*** or perceptions of others evaluations of one's ethnic-racial group(s);
4. ***Private regard*** or self-evaluations of one's own ethnic-racial group(s); and
5. ***Ideology*** or beliefs about how the group(s) should behave.

Differences have arisen in how these dimensions have been applied to different racial and ethnic groups and how they are considered to be related to developmental processes. For example, the Ethnic Identity Scale, which is widely used in the study of multiple ethnicities, includes two subscales, namely, exploration and resolution, that assess the developmental process of identity, and a third subscale, affirmation, that assesses evaluative identity content (Umaña-Taylor, Yazedjian, & Bámaca-Gómez, 2004).

The *Ethnic and Racial Identity in the 21st Century Study Group* undertook a comprehensive review and reconceptualization of racial and ethnic identity that resulted in the publication of a new integrative multidimensional conceptualization (Umaña-Taylor, Quintana, Lee, Cross, Rivas-Drake, Schwartz, Syed, Yip, & Seaton, 2014). This new perspective includes the multiple dimensions of both identity content and developmental processes, and is applicable to both racial and ethnic categories. An important contribution of the 21st Century Study Group was to combine the concepts of ethnic identity and racial identity into a single hyphenated construct, referred to as ***ethnic-racial identity***. Historically, the concept of race has been applied to the study of US-born blacks and whites, but it has become clear that racial categories are socially constructed when specific characteristics and group affinities are "racialized." Ethnicity, on the other hand, is a concept applied to a multitude of groups of people with shared cultural heritage, values, and traditions, and sometimes language, and is transmitted across generations.

Both race and ethnicity have consequences for social experience and psychological development. They are often

overlapping and interdependent. The hyphenated term, ethnic-racial identity, indicates that both race, as racialized categories within society, and ethnicity, as cultural heritage, are relevant, and that they are closely related in terms of similar processes and outcomes. This perspective underscores the principle of ***intersectionality***, in that it highlights the specificity of ethnic-racial identities as particular combinations of racialized characteristics, ethnicity, cultural background, and immigration status (Crenshaw, 1989, 1991). It would suggest, for example, that Black adolescents night have very different identities (along with experiences and treatment) if they come from families who have lived in the US for centuries, compared to recent Jamaican or Haitian immigrants. This perspective encourages researchers to acknowledge and examine the wide heterogeneity *inside* groups that up to now may have been combined into categories like "Black," "Latinx," or "Asian American."

Required Reading: Development of a Strong Positive Ethnic-Racial Identity as a Protective Factor for Children and Youth

This short paper provides an overview of the importance of positive ethnic-racial identities and ethnic-racial socialization for the healthy development of children and youth. These assets protect children and youth from discriminatory experiences and messages, and provide a strong foundation for long-term resilience and thriving.

Abstract. Experiences of racial and ethnic discrimination pose significant threats to the development and wellbeing of racial and ethnic minority children. Fortunately, not all youth who experience discrimination are susceptible to its harmful effects. Growing evidence points to several racial and ethnic factors that promote positive youth development and protect against the potentially damaging effects of racial and ethnic adversity. This article summarizes emerging research trends and conclusions regarding the "promotive" and "protective" effects of racial and ethnic identity, ethnic-racial socialization, and cultural orientation, as well as some of the mechanisms that may account for their salutary properties. The article concludes with a brief discussion of important considerations and directions for the future study of racial and ethnic resilience processes in ethnic minority youth.

Neblett Jr, E. W., Rivas-Drake, D., & Umaña-Taylor, A. J. (2012). The promise of racial and ethnic protective factors in promoting ethnic minority youth development. *Child Development Perspectives*, 6(3), 295-303.

Do White People Possess an Ethnic-Racial Identity?

Researchers who study ethnic-racial identity often say that in the US, many white people are "un-racialized" in that their race is not a salient part of their identity, and they have not examined or explored their own experiences and treatment through a racial lens. Historically, many white Americans have focused on their *ethnic* identity– they or their ancestors are members of specific immigrant and religious groups, many of whom have experienced oppression and marginalization, including Jewish, Irish, Polish, and Italian immigrants. But white adolescents have typically thought much less about their racial heritage. Dominant groups, who assume that they are the default or prototype group in a given society, often racialize out-group members (i.e., non-white groups) while resisting the idea that they too have a racial identity. For example, you will notice that African-Americans and Asian-Americans are often referred to using a

hyphenated label, whereas we read much less about European-Americans. Social movements today provide white European-Americans opportunities to reflect on and construct a racialized identity.

Today, there are a subgroup of white people who are experiencing a different kind of awareness of their ethnic-racial identity, based on perceived threats stemming from rapid social change and uncertainty about status and privilege. Although the source and nature of these experiences may not be readily apparent, we don't want to underestimate their psychological and social consequences in the lived experiences of real people and those with whom they interact. Experiences of threatened evaluative status of personal and group identity are familiar to members of marginalized groups. This area has been studied by psychologists using several concepts and theoretical perspectives. One important concept is ***stereotype threat***, which is a process by which people internalize (usually negative) messages from others about their own subgroups (i.e., stereotypes), then when their identity is made salient or they are faced with challenging tasks, those internalized evaluations are triggered. The mental activation of stereotypes (i.e., threat) can have adverse personal consequences, such as increased self-doubt, reduced performance, or giving up. Social psychologists have emphasized responses to threat by members of threatened or marginalized groups that take the form of increasing the status of one's own group (ingroup) or derogating members of other groups (outgroup).

Threats to identity are particularly relevant in adolescence and early adulthood, when identity is crystallizing, and in times of change and transition, either personal or societal. Perceived threat is complex and challenging to study when it occurs in the experience of privileged groups. For example, a research literature has emerged focused on the study of threats to masculinity. Some of the research on white ethnic-racial identity comes under the heading of whiteness studies. Whiteness is a concept that attempts to capture the shared experience of the social and historical interpretations and consequences of being white in a particular society at a particular time. Recently, these lenses have been used to try to understand the appeal a white supremacist identity, which seems to attract some marginalized white youth, especially males who did not complete their education.

Self-concept and Self-esteem during Adolescence

In adolescence, teens' self-concepts continue to develop. 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 angry and sullen, with their friends they are more outgoing and goofier, 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 differentiates, so too 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 competencies in romantic relationships, on the job, and in close friendships (Harter, 2006). Self-esteem often drops 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 declines 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 competent in their peer relationships, appearance, and athletic abilities (Birkeland, Melkivik, Holsen, & Wold, 2012).

Parents and Teens: Autonomy and Attachment

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 typically occur because an adolescent's desire for independence and autonomy conflicts with parental supervision and control. These types of arguments tend to decrease as teens develop (Galambos & Almeida, 1992).

Teens report more conflict with their mothers (than their fathers), as many mothers believe they should still have some control over many of these areas, but at the same time teens often report that their mothers are also more encouraging and supportive (Costigan, Cauce, & Etchison, 2007). As teens grow older, more compromise is reached between parents and teenagers (Smetana, 2011). Teenagers begin to behave more responsibly and parents increasingly recognize their need for autonomy. Parents are more controlling of daughters, especially early maturing girls, than they are sons (Caspi, Lynam, Moffitt, & Silva, 1993). In addition, culture and ethnicity also play a role in how restrictive parents are with the daily lives of their children (Chen, Vansteenkiste, Beyers, Soensens, & Van Petegem, 2013).

Teenagers benefit from supportive, less conflict-ridden relationships with parents. Research on attachment in adolescence find that teens who are still securely attached to their parents have fewer emotional problems (Rawatlal, Kliewer & Pillay, 2015), are less likely to engage in drug abuse and other criminal behaviors (Meeus, Branje & Overbeek, 2004), and have more positive peer relationships (Shomaker & Furman, 2009).

Peers

Figure 7.12. Peers associate on the basis of similarity

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. This increase in intimacy, mutuality, and reciprocity characterizes both teen friendships and relationships with members of adolescent peer groups. 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 a function of **homophily**, that is, *adolescents who are similar to one another choose to spend time together in a "birds of a feather flock together" way*. Adolescents who spend time together also shape each other's behavior and attitudes. Peers serve as important sources 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 have conflictual peer relationships.

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.

Peers and Socially Undesirable Behavior

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 family. One negative aspect of adolescent peer influence is known as **deviant peer contagion** (Dishion & Tipsord, 2011), *which 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.*

Parents and other adults are often concerned about these potential negative influences of peers, which can affect behavior, attitudes, and identity development. Peers can be associated with the adoption of unhealthy or antisocial behaviors, and also with the adoption of negative attitudes toward school, or socially undesirable norms and values. Often this is a transient rebellious phase, something some teens go through. But longer term, there is concern that these events may ultimately lead to patterns of antisocial or criminal behavior and identity. The biggest challenge for researchers is to sort out the relative importance of **selection** and **influence** in these circumstances. To what extent do adolescents **select** similar others on the same developmental path as themselves, and to what extent are they **influenced** by those in whose proximity they find themselves? It's complicated. We are faced with a chicken or egg problem. Which came first, the bad influence of undesirable behavior by others, or a desire for defiant behavior? Unhealthy and delinquent behaviors and negative attitudes toward societal norms and values are preexisting within larger societal contexts and may be freely chosen by some teens, but they are also adopted within local social contexts where intragroup processes and social influence are at play. Aggressive or rebellious youth sometimes take a leadership role and become role models within peer groups. Individual differences are also at play. Adolescent development in peer contexts involves the individual's own previous personal history. It involves their social experiences of acceptance and rejection on different attributes. It overlaps with their negotiation of personal and social identities that make sense and work for the individual. Within this complex reality, it is hard to make generalizations about cause and effect. We can, however, share the concern for finding ways to promote optimal development and well-being, and look forward to continuing research efforts focused on the dark side of peer relationships and adolescent development.

Romantic Relationships

Figure 7.13. Romantic relationships contribute to adolescent adjustment

Adolescence is the developmental period during which romantic relationships typically first emerge. By the end of adolescence, most American teens have had at least one romantic relationship (Dolgin, 2011). However, culture does play a role as Asian Americans and Latinas are less likely to date than other ethnic groups (Connolly, Craig, Goldberg, & Pepler, 2004). Dating serves many purposes for teens, including having fun, companionship, status, socialization, sexual experimentation, intimacy, and (for those in late adolescence) partner selection (Dolgin, 2011).

There are several stages in the dating process beginning with engaging in mixed-sex group activities in early adolescence (Dolgin, 2011). The 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). Interacting in mixed-sex groups is easier for teens as they are among a supportive group of friends, can observe others interacting, and are kept safe from a too early intimate relationship. By middle adolescence teens are engaging in brief, casual dating or in group dating with established couples (Dolgin, 2011). Then in late adolescence dating involves exclusive, intense relationships. These relationships tend to be long-lasting and continue for a year or longer, however, they may also interfere with friendships. 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 tied more 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 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 adolescent sexuality, in large part because of concerns related to sexual intercourse, sexually-transmitted diseases, contraception, and preventing teen pregnancies. However, sexuality involves more than this narrow focus. For example, adolescence is often the time when individuals who are lesbian, gay, bisexual, or transgender come to recognize themselves as such (Russell, Clarke, & Clary, 2009). Thus, romantic relationships are a domain in which adolescents experiment with new behaviors and identities.

However, a negative dating relationship can adversely affect an adolescent's development. Soller (2014) explored the link between relationship inauthenticity and mental health. **Relationship inauthenticity** *refers to an incongruence between thoughts/feelings and actions within a relationship.* Desires to gain partner approval and demands in the relationship may negatively affect an adolescent's sense of authenticity. Because of the high status our society places on romantic relationships, especially for girls, adolescents sometimes allow themselves to be pressured into behaviors with which they are not really comfortable, and experience tension between their desires to be in a relationship and their need to set boundaries in the face of their partner's wishes or demands. Soller found that relationship inauthenticity was positively correlated with poor mental health, including depression, suicidal ideation and suicide attempts, especially for females.

Supplemental Materials

- This documentary by Shakti Butler explores the school-to-prison-pipeline and the impact of the criminal legal system on minoritized populations.

  https://www.world-trust.org/healing-justice

- This article discusses how harsh discipline school policies impact Black girls.

  Hines-Datiri, D., & Carter Andrews, D. J. (2017). The Effects of Zero Tolerance Policies on Black Girls. Urban Education, 0042085917690204. https://doi.org/10.1177/0042085917690204

- This article explores racial identity in Black adolescents and how issues of respectability contribute to that identity development.

  Duncan, G. A., & McCoy, H. (2007). Black adolescent racial identity and respectability. Negro Educational Review, 58(1/2), 35.

- This article reviews the literature on racial identity development of Black adolescents and discusses the role of education in fostering positive racial identity development.

  DeCuir-Gunby, J. T. (2009). A Review of the Racial Identity Development of African American Adolescents: The Role of Education. Review of Educational Research, 79(1), 103–124. https://doi.org/10.3102/0034654308325897

- This article discusses the "promotive" and "protective" effects of racial and ethnic identity, ethnic-racial

socialization, and cultural orientation on youth of color.

Neblett, E. W., Rivas-Drake, D., & Umana-Taylor, A. D. (2012.) The promise of racial and ethnic protective factors in promoting ethnic minority youth development. Child Development Perspectives, 6(3), 295-303.

- This chapter discusses the field of youth organizing as an area of research.

Christens, B. D., & Kirshner, B. (2011). Taking stock of youth organizing: An interdisciplinary perspective. New Directions for Child and Adolescent Development, 2011(134), 27–41. https://doi.org/10.1002/cd.309

- This short video informs teens how to get involved in youth activism.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://pdx.pressbooks.pub/humandevelopment/?p=1165#oembed-1

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Emerging Adulthood & Cognition

Emerging Adulthood

Historically, early adulthood was considered to last from approximately the age of 18 (the end of adolescence) until 40 or 45 (the beginning of middle adulthood). More recently, developmentalists have divided this 25 year age period into two separate stages: Emerging adulthood followed by early adulthood. Although these age periods differ in their physical, cognitive, and social development, overall the age period from 18 to 40 is a time of peak physical capabilities and the emergence of more mature cognitive development, financial independence, and the establishment of intimate relationships.

Emerging Adulthood Defined

Emerging adulthood is the *period between the late teens and early twenties*; ages 18-25, although some researchers have included up to age 29 in their definitions (Society for the Study of Emerging Adulthood, 2016). Jeffrey Arnett (2000) argues that emerging adulthood is neither adolescence nor is it young adulthood. Individuals in this age period have left behind the relative dependency of childhood and adolescence but have not yet taken on the responsibilities of adulthood. "Emerging adulthood is a time of life when many different directions remain possible, when little about the future is decided for certain, when the scope of independent exploration of life's possibilities is greater for most people than it will be at any other period of the life course" (Arnett, 2000, p. 469). Arnett identified five characteristics of emerging adulthood that distinguish it from adolescence and young adulthood (Arnett, 2006).

1. It is the **age of identity exploration**. In 1950, Erik Erikson proposed that it was during adolescence that humans wrestled with the question of identity. Yet, even Erikson (1968) commented on a trend during the 20th century of a "prolonged adolescence" in industrialized societies. Today, most identity development occurs during the late teens and early twenties rather than adolescence. It is during emerging adulthood that people are exploring their career choices and ideas about intimate relationships, setting the foundation for adulthood.
2. Arnett also described this time period as the **age of instability** (Arnett, 2000; Arnett, 2006). Exploration generates uncertainty and instability. Emerging adults change jobs, relationships, and residences more frequently than other age groups.
3. This is also the **age of self-focus**. Being self-focused is not the same as being "self-centered." Adolescents are more self-centered than emerging adults. Arnett reports that in his research, he found emerging adults to be very considerate of the feelings of others, especially their parents. They now begin to see their parents as people not just parents, something most adolescents fail to do (Arnett, 2006). Nonetheless, emerging adults focus more on themselves, as they realize that they have few obligations to others and that this is the time where they can do what they want with their life.
4. This is also the **age of feeling in-between.** When asked if they feel like adults, more 18 to 25 year-olds answer "yes and no" than do teens or adults over the age of 25 (Arnett, 2001). Most emerging adults have gone through the changes of puberty, are typically no longer in high school, and many have also moved out of their parents' home. Thus, they no longer feel as dependent as they did as teenagers. Yet, they may still be financially dependent on their parents to some degree, and they have not completely attained some of the indicators of adulthood, such as finishing their education, obtaining a good full-time job, being in a committed relationship, or being responsible for others. It is not surprising that Arnett found that 60% of 18 to 25 year-olds felt that in some ways they were adults, but in some ways, they were not (Arnett, 2001).

5. Emerging adulthood is the **age of possibilities**. It is a time period of optimism as more 18 to 25 year-olds feel that they will someday get to where they want to be in life. Arnett (2000, 2006) suggests that this optimism is because these dreams have yet to be tested. For example, it is easier to believe that you will eventually find your soul mate when you have yet to have had a serious relationship. It may also be a chance to change directions, for those whose lives up to this point have been difficult. The experiences of children and teens are influenced by the choices and decisions of their parents. If the parents are dysfunctional, there is little a child can do about it. In emerging adulthood, however, people can move out and move on. They have the chance to transform their lives and move away from unhealthy environments. Even those whose lives were happy and fulfilling as children, now have the opportunity in emerging adulthood to become independent and make their own decisions about the direction they would like their lives to take.

Socioeconomic Class and Emerging Adulthood. The theory of emerging adulthood was initially criticized as only reflecting upper middle-class, college-attending young adults in the United States and not those who were working class or poor (Arnett, 2016). Consequently, Arnett reviewed results from the 2012 Clark University Poll of Emerging Adults, whose participants were demographically similar to the United States population. Results primarily indicated consistencies across aspects of the theory, including positive and negative perceptions of the time-period and views on education, work, love, sex, and marriage. Two significant differences were found, the first being that emerging adults from lower socioeconomic classes identified more negativity in their emotional lives, including higher levels of depression. Secondly, those in the lowest socioeconomic group were more likely to agree that they had not been able to find sufficient financial support to obtain the education they believed they needed. Overall, Arnett concluded that emerging adulthood exists wherever there is a period between the end of adolescence and entry into adult roles, but also acknowledged that social, cultural, and historical contexts were important.

Cross-cultural Variations. The five features proposed in the theory of emerging adulthood originally were based on research involving Americans between ages 18 and 29 from various ethnic groups, social classes, and geographical regions (Arnett, 2004, 2016). 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 (United Nations Development Programme, 2011). The rest of the 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 other OECD countries as little is known about the experiences of 18-25 year-olds in developing countries.

The same demographic changes as described above for the United States have taken place in other OECD countries as well. This is true of increasing participation in postsecondary education, as well as increases in the 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 emerging adults in developed Asian 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, including 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.

Figure 8.1. Is your culture one that promotes romantic relationships for emerging adults? Or does it encourage you to wait till you're older? What would it be like to live in the opposite culture?

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, and compared to emerging adults in the West, they pay more heed to their parents' wishes about what they should study, what job they should take, and where they should live (Rosenberger, 2007).

When Does Adulthood Begin? According to Rankin and Kenyon (2008), in years past the process of becoming an adult was more clearly marked by rites of passage. For many, marriage and parenthood were considered entry into adulthood. However, these role transitions are no longer considered the important markers of adulthood (Arnett, 2001). Economic and social changes have resulted in more young adults attending college (Rankin & Kenyon, 2008) and delaying marriage and having children (Arnett & Taber, 1994; Laursen & Jensen-Campbell, 1999) Consequently, current research has found financial independence and accepting responsibility for oneself to be the most important markers of adulthood in Western culture across age (Arnett, 2001) and ethnic groups (Arnett, 2004).

In looking at college students' perceptions of adulthood, Rankin and Kenyon (2008) found that some students still view rites of passage as important markers. College students who placed more importance on role transition markers, such as parenthood and marriage, belonged to a fraternity/sorority, were traditionally aged (18–25), belonged to an ethnic minority, were of a traditional marital status (i.e., not cohabitating), or belonged to a religious organization, particularly for men. These findings supported the view that people holding collectivist or more traditional values place more importance on role transitions as markers of adulthood. In contrast, older college students and those cohabitating did not value role transitions as markers of adulthood as strongly.

Young Adults Living Arrangements. In 2014, for the first time in more than 130 years, adults 18 to 34 were more likely to be living in their parents' home than they were to be living with a spouse or partner in their own household (Fry, 2016). The current trend is that young Americans are not choosing to settle down romantically before age 35. Since 1880, living

with a romantic partner was the most common living arrangement among young adults. In 1960, 62% of America's 18- to 34-year-olds were living with a spouse or partner in their own household, while only 20% were living with their parents.

By 2014, 31.6% of early adults were living with a spouse or partner in their own household, while 32.1% were living in the home of their parent(s). Another 14% of early adults lived alone, were a single parent, or lived with one or more roommates. The remaining 22% lived in the home of another family member (such as a grandparent, in-law, or sibling), a non-relative, or in group quarters (e.g., college dormitories). Comparing ethnic groups, 36% of black and Hispanic early adults lived at home, while 30% of white young adults lived at home.

As can be seen in Figure 20.2, gender differences in living arrangements were also noted in that young men were living with parents at a higher rate than young women. In 2014, 35% of young men were residing with their parents, while 28% were living with a spouse or partner in their own household. Young women were more likely to be living with a spouse or partner (35%) than living with their parents (29%). Additionally, more young women (16%) than young men (13%) were heading up a household without a spouse or partner, primarily because women are more likely to be single parents living with their children. Lastly, young men (25%) were more likely than young women (19%) to be living in the home of another family member, a non-relative, or in some type of group quarters (Fry, 2016).

What are some factors that help explain these changes in living arrangements? First, early adults are increasingly postponing marriage or choosing not to marry or cohabitate. Lack of employment and lower wages have especially contributed to males residing with their parents. Men who are employed are less likely to live at home. Wages for young men (adjusting for inflation) have been falling since 1970 and correlate with the rise in young men living with their parents. The recent recession and recovery (2007-present) has also contributed to the increase in early adults living at home. College enrollments increased during the recession, which further increased early adults living at home. However, once early adults possess a college degree, they are more likely to establish their own households (Fry, 2016).

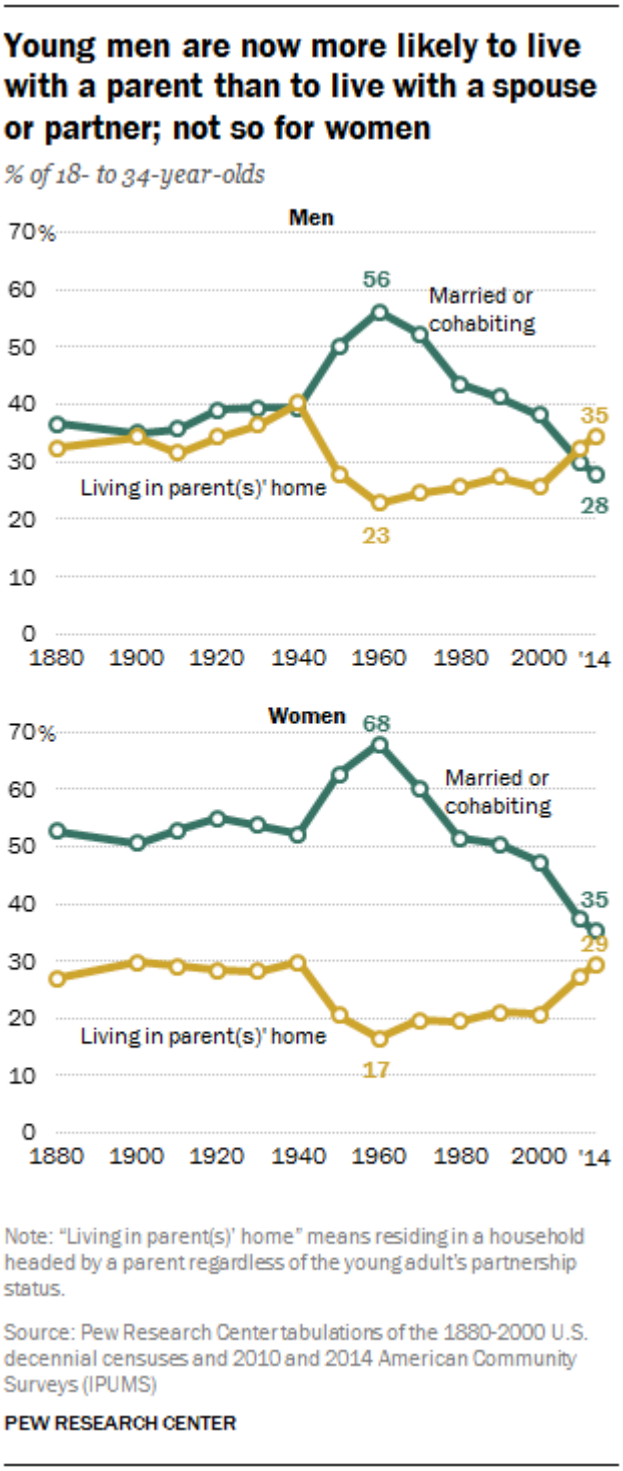

Figure 8.2

Cognitive Development in Early Adulthood

Emerging adulthood brings with it the consolidation of formal operational thought, and the continued integration of the

parts of the brain that serve emotion, social processes, and planning and problem solving. As a result, rash decisions and risky behavior decrease rapidly across early adulthood. Increases in epistemic cognition are also seen, as young adults' meta-cognition, or thinking about thinking, continues to grow, especially young adults who continue with their schooling.

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.

Table 8.1 Stages of Perry's Scheme

Stage	Summary of Position in Perry's Scheme	Basic Example
Dualism		
	The authorities know	"the tutor knows what is right and wrong"
	The true authorities are right, the others are frauds	"my tutor doesn't know what is right and wrong but others do"
	There are some uncertainties and the authorities are working on them to find the truth	"my tutors don't know, but somebody out there is trying to find out"
Multiplicity		
	(a) Everyone has the right to their own opinion	"different tutors think different things"
	(b) The authorities don't want the right answers. They want us to think in a certain way	"there is an answer that the tutors want and we have to find it"
	Everything is relative but not equally valid	"there are no right and wrong answers, it depends on the situation, but some answers might be better than others"
	You have to make your own decisions	"what is important is not what the tutor thinks but what I think"
Relativism		
	First commitment	"for this particular topic I think that…."
	Several Commitments	"for these topics I think that…."
	Believe own values, respect others, be ready to learn	"I know what I believe in and what I think is valid, others may think differently and I'm prepared to reconsider my views"

Adapted from Lifespan Development by Lumen Learning

Some researchers argue that a qualitative shift in cognitive development tales place for some emerging adults during their mid to late twenties. As evidence, they point to studies documenting continued integration and focalization of brain functioning, and studies suggesting that this developmental period often represents a turning point, when young adults engaging in risky behaviors (e.g., gang involvement, substance abuse) or an unfocused lifestyle (e.g., drifting from job to job or relationship to relationship) seem to "wake up" and take ownership for their own development. It is a common point for young adults to make decisions about completing or returning to school, and making and following through on decisions about vocation, relationships, living arrangements, and lifestyle. Many young adults can actually remember these turning points as a moment when they could suddenly "see" where they were headed (i.e., the likely outcomes of their risky behaviors or apathy) and actively decided to take a more self-determined pathway.

Optional Reading: Current Trends in Post-secondary Education

According to the National Center for Higher Education Management Systems (NCHEMS) (2016a, 2016b, 2016c, 2016d), in the United States:

- 84% of 18 to 24 year olds and 88% of those 25 and older have a high school diploma or its equivalent
- 36% of 18 to 24 year olds and 7% of 25 to 49 year olds attend college
- 59% of those 25 and older have completed some college
- 32.5% of those 25 and older have a bachelor's degree or higher, with slightly more women (33%) than men (32%) holding a college degree (Ryan & Bauman, 2016).

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 fact that the cost of attaining a degree is higher in the U.S. than in most other nations.

In 2017, 65% of college seniors who graduated from private and public nonprofit colleges had student loan debt, and nationally owed an average of $28,650, a 1% decline from 2016 (The Institute for College Access & Success (TICAS), 2018).

According to the most recent TICAS annual report, the rate of debt varied widely across states, as well as between colleges. The after graduation debt ranged from $18,850 in Utah to $38,500 in Connecticut. Low-debt states are mainly in the West, and high-debt states in the Northeast. In recent years there has been a concern about students carrying more debt and being more likely to default when attending for-profit institutions. In 2016, students at for-profit schools borrowed an average of $39,900, which was 41% higher than students at non-profit schools that year. In addition, 30% of students attending for-profit colleges default on their federal student loans. In contrast, the default level of those who attended public institutions is only 4% (TICAS, 2018).

College student debt has become a key political issue at both the state and federal level, and some states have been taking steps to increase spending and grants to help students with the cost of college. However, 15% of the Class of 2017's college debt was owed to private lenders (TICAS, 2018). Such debt has less consumer protection, fewer options for repayment, and is typically negotiated at a higher interest rate. See Table 7.1 for a debt comparison of 6 U.S. States.

Graduate School: Larger amounts of student debt actually occur at the graduate level (Kreighbaum, 2019). In 2019, the highest average debts were concentrated in the medical fields. Average median debt for graduate programs included:

- $42,335 for a master's degree
- $95,715 for a doctoral degree
- $141,000 for a professional degree

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 life time. Moreover, the benefits of 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 and less dogmatic and ethnocentric compared to those not in college (Pascarella, 2006).

Is college worth the time and investment? College is certainly a substantial investment each year, with the financial burden falling on students and their families in the U.S., and covered mainly by the government in many other nations. Nonetheless, the benefits both to the individual and the society outweighs the initial costs. As can be seen in Figure 7.18, those in America with the most advanced degrees earn the highest income and have the lowest unemployment.

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