

Understanding the Whole Child

Cover Image: [Children Playing at Sunset](#) by Rene Bernal via Unsplash.

[*Understanding the Whole Child*](#) is a Minnesota State University Pressbooks published version of the open textbook [*Understanding the Whole Child*](#) which is a renamed version of [Child Growth and Development](#) by Jennifer Paris, Antoinette Ricardo, Dawn Rymond, & Alexa Johnson, College of the Canyons shared under a [CC BY](#) license.

See the versioning history chapter at the end of this open textbook.



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ACKNOWLEDGEMENTS

I would like to thank:

My department including my full-time faculty colleagues, Cindy Stephens and Wendy Ruiz, who supported me pursuing the grant that funded this book and believe in the purpose of our OER work.

James Glapa-Grossklag for taking a chance on working with me for this grant before he really knew me and for all the opportunities I have been afforded since then.

Brian Weston for his leadership, guidance, and just being there to help facilitate the amazing project that this book is part of.

Alexa Johnson for her painstaking work on the book and taking words on pages and turning them into this beautiful book.

Chloe McGinley, Joy Shoemate, Trudi Radtke, and any other OER and Online Education staff that helped me maintain my sanity in this project.

My co-authors, Antoinette Ricardo and Dawn Rymond, for their tireless efforts and collaboration.

The peer reviewers, Michelle Hancock, Gina Peterson, and Ashlei Snead for widening the collaboration and their work to make the book better.

The ECE 101 students of Spring 2019 at College of the Canyons for piloting the textbook, chapter by chapter with us and providing feedback and content that may be used to create supplementary resources.

My family, especially my children Ashlynn and Aidan, for being understanding of the time and energy commitments that this book, the larger project it is part of, and my advocacy for OER has taken.

Amanda Taintor, my colleague, ally, and co-conspirator in the effort to engage the field of Early Childhood Education in OER efforts.

The larger OER community that keeps me thinking and pushing my understanding of what open is, what it should be, and what role I can play in that.

Jennifer Paris

First and foremost, I would like to thank God for blessing me with an amazing job that allows me to teach and grow each and every day. Thank you to College of the Canyons and our whole OER team for making this vision a reality. Special thanks to Jennifer Paris who has not only mentored me and been a great friend, but has also lead us in this whole OER journey. I'm grateful to work for a such a wonderful department that sets the foundation for positive growth in children.

Thank you to my parents and my brother whose love and support has gotten me to where I am today. To my husband, Andres, thank you for always believing in me and pushing me to be the best I can be, I love you.

To my children, Manolo and Paloma; this book is for you. Every day, you are my inspiration. Mamita te ama!

Antoinette Ricardo

Writing and contributing to this textbook has been a labor of love. My hope is that after students gain knowledge, they will continue to be inspired to learn and will be a positive role in the lives of children.

I would like to say a special thank you to College of the Canyons, ECE department. I've been very fortunate to be a part of this outstanding Open Educational Resources (OER) team, which has been a supportive and collaborative experience. I'd like to thank Jennifer Paris, the faculty lead for the grant that funded the creation of this and other OER books for our department.

I am continually grateful to my family. Thank you, Nick, Jake, and Jordan, for your continually love and support.

"Education is not the preparation for life; education is life itself."

-John Dewey

Dawn Rymond

CHAPTER 1: INTRODUCTION TO CHILD DEVELOPMENT

Chapter Objectives

After this chapter, you should be able to:

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

Introduction

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.[\[1\]](#)

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.

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 four stages as follows:

Prenatal Development (conception through birth)

Infancy and Toddlerhood (birth through two years)

Preschool (3 to 5 years)

School-age (6 to 9 years)

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 1.1 – A tiny embryo depicting some development of arms and legs, as well as facial features that are starting to show. [4]

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 – A swaddled newborn. [5]

Preschool

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 1.3 – Two young children playing in the Singapore Botanic Gardens[6]

School-age/Primary years

The ages of six through eleven comprise school-age years 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 1.4 - Two children running down the street in Carenage, Trinidad and Tobago[7]

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 1.5 - Two smiling teenage women.[9]

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

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 more abrupt change? 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.

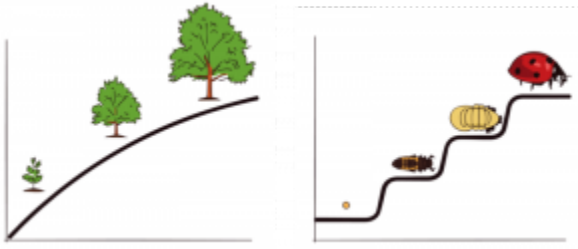


Figure 1.6 – The graph to the left shows three stages in the continuous growth of a tree. The graph to the right shows four distinct stages of development in the life cycle of a ladybug.[10]

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

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 ‘blindness’ 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, diet might really be creating the 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.

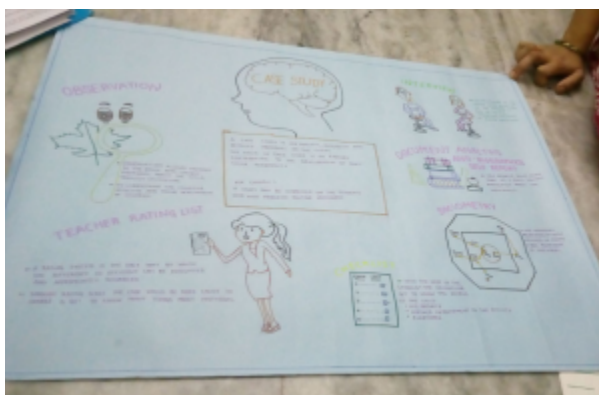


Figure 1.7 – Illustrated poster from a classroom describing a case study.[12]

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 **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 1.8 – A longitudinal research design.[13]

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.

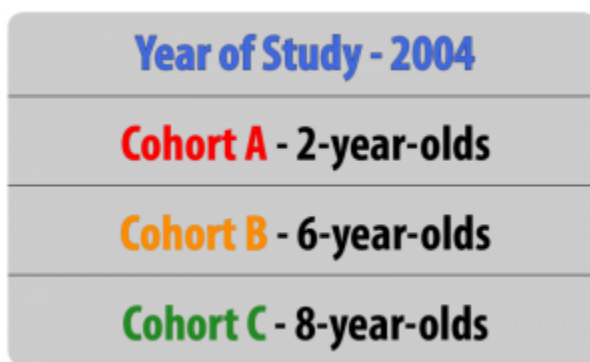


Figure 1.9 – A cross-sectional research design.[14]

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.

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.[\[16\]](#)

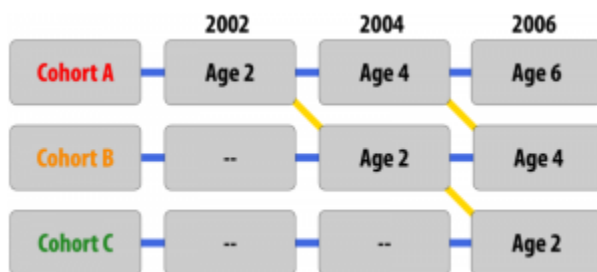


Figure 1.10 – A sequential research design.[15]

Table 1.1 – Advantages and Disadvantages of Different Research Designs[17]

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
Cross-sectional	Examines changes between participants of different ages at the same point in time Provides information on age-related change	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	Cannot examine change over time Cannot 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 potential 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.

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 3 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.

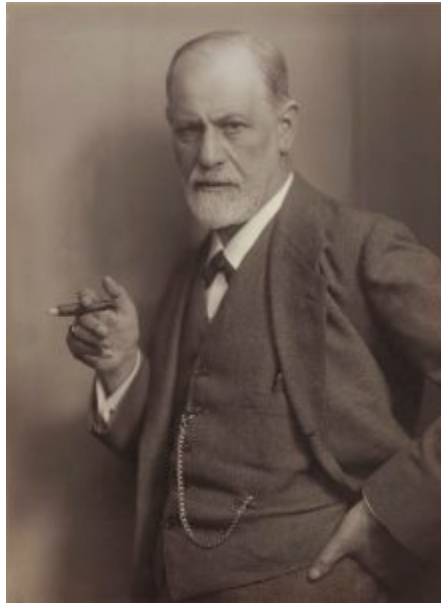


Figure 1.11 – Sigmund Freud.[21]

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**

1.2 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 1.12 - Erik Erikson.[23]

Erikson expanded on 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 1.3 – 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 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.

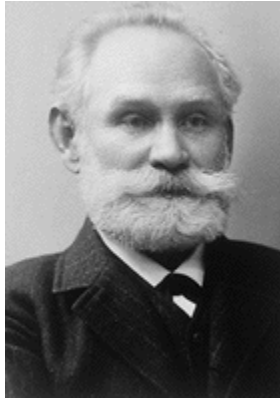


Figure 1.13 – Ivan Pavlov.[26]

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 1.14 – John B. Watson,[27]

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

1. 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.

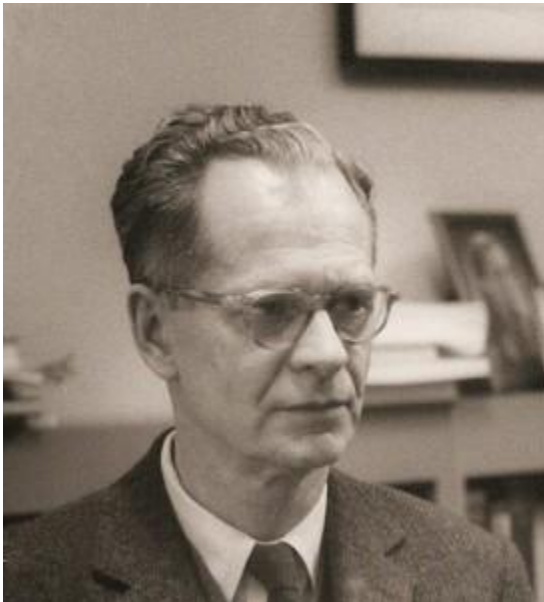


Figure 1.15 – B. F. Skinner.[28]

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 1.16 – Albert Bandura.[29]

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 rat.
- 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 1.17 - Jean Piaget.[32]

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 schemas 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 1.4 – 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.
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 as their cognitive skills mature through 4 stages: sensorimotor stage, preoperational stage, concrete 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 1.18- Lev Vygotsky.[36]

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 1.19 – Urie Bronfenbrenner.[39]

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

Table 1.5 – 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 1.20 – Bronfenbrenner's ecological systems theory.[40]

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.

Conclusion

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.

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CHAPTER 2: CONCEPTION, HEREDITY, & PRENATAL DEVELOPMENT

Chapter 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.

INTRODUCTION

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.[\[1\]](#)

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 – Two skiers. [3]

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).

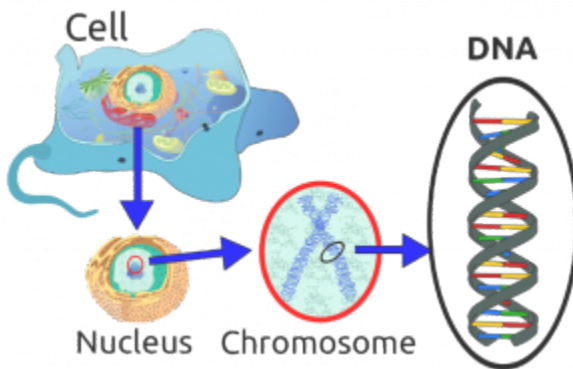


Figure 2.2 – DNA's location in the cell. [5]

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[\[6\]](#)

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

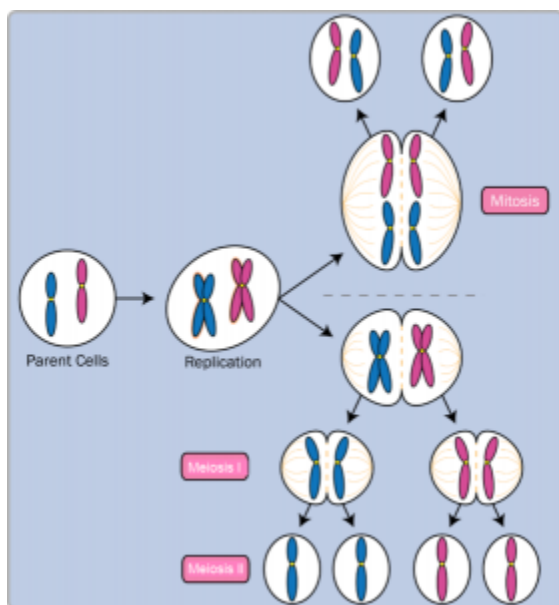


Figure 2.3 – Mitosis and Meiosis.[7]

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).

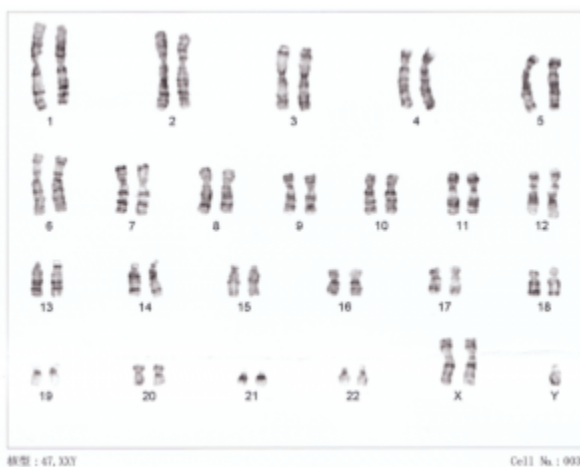


Figure 2.4 - The 23 pairs of chromosomes.[9]

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)[\[11\]](#)

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
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)[12]

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[13]

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[\[15\]](#)

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.

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^[19]

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.
XXX 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.

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 2.7 – Sperm and ovum at conception.[20]

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 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 which nourishes the developing organism. This stage ends when the blastocyst fully implants into the uterine wall (U.S. National Library of Medicine, 2015).

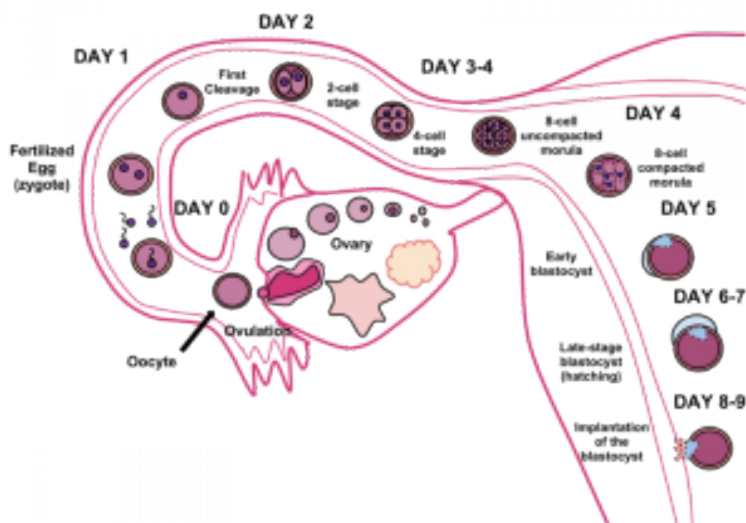


Figure 2.8 – The cycle of fertilization.[21]

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 2.9 - A human embryo.[23]

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 2.10 - A human fetus.[\[25\]](#)

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 2.11 - The development of a fetus.[27]

MONOZYGOTIC AND DIZYGOTIC TWINS

Monozygotic Twins [29] 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.

Dizygotic Twins [30] 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 2.12 - Monozygotic Twins

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,



Figure 2.13 - Dizygotic Twins

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.[\[31\]](#)

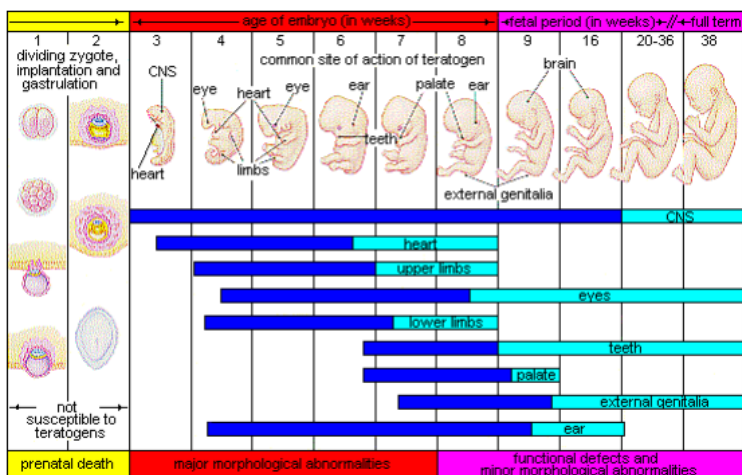


Figure 2.14 - The development of an embryo into a fetus.[32]

There are four categories of teratogens: **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. **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.

Infections: Different maternal infections, including rubella virus, herpes simplex virus, and syphilis can cause congenital abnormalities in fetuses.

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 that 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]

Teratogens from Animals/Pets

Teratogen	Potential Effects
Toxoplasmosis	This parasite can be passed through cat feces and undercooked meat (especially pork, lamb, or deer meat). 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 2.15 – A pregnant woman relaxing in a tub.[\[54\]](#)

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.[55]

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.[56]

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	Gain 28-30 pounds 1-4½ pounds in the 1st trimester	Gain 12-25 pounds 1-4½ pounds in the 1st trimester	11-20 pounds 1-4½ pounds in the 1st trimester
1 pound per week in the 2nd and 3rd trimesters	A little more than 1 pound per week thereafter	A little more than ½ pound per week in 2nd and 3rd trimesters	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 face 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 abnormal 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.[\[58\]](#) Monsanto pesticide to be sprayed on food crops.

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.[59]

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.

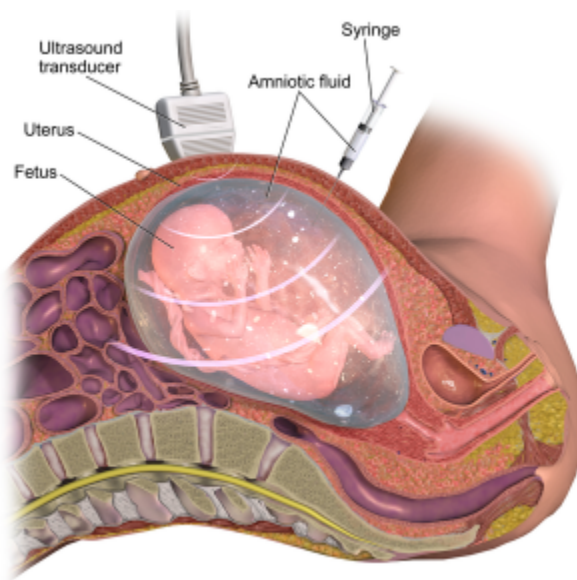


Figure 2.20 – Amniocentesis. [60]

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. [62]

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

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]



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]



Figure 2.23 – This same-sex couple used a surrogate.



Figure 2.24 – This single mother adopted her daughter.

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.

Conclusion

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

Next, we will explore birth and the newborn baby... (Chapter 3)

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CHAPTER 3: BIRTH AND THE NEWBORN

Chapter 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.

INTRODUCTION

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.

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 – Approaches to Childbirth[\[1\]](#)

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	<p>"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]</p>
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] It can also make it difficult for the doctor or midwife to attend to the birth by obstructing the view.
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 – Expectant parents in a childbirth preparation class. [\[8\]](#)

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.[\[9\]](#)

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.

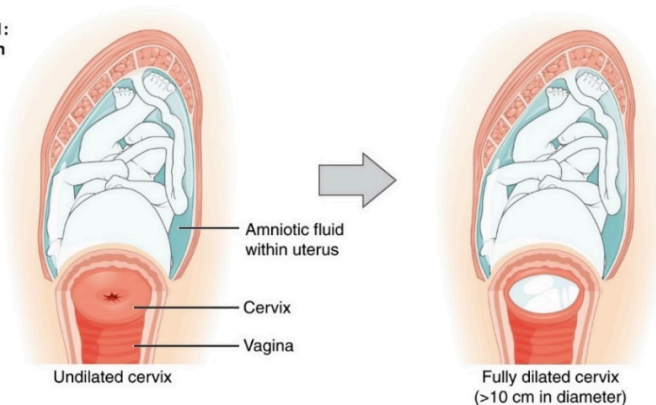
The Second Stage

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.[\[12\]](#)

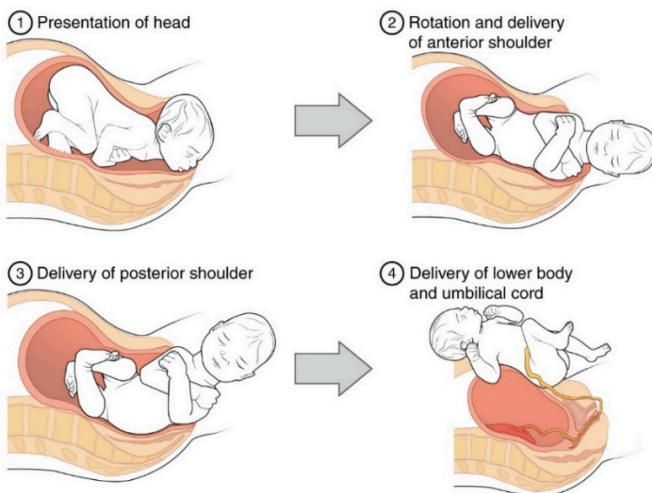
The Third Stage

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.[\[14\]](#)

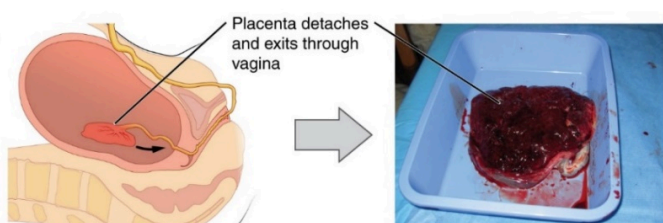
**Stage 1:
Dilation**



**Stage 2:
Birth**



**Stage 3:
Afterbirth delivery**



Figures 3.2-3.4 - Three stages of childbirth

Figure 3.2 – Early cervical dilation.

Figure 3.3 – Full dilation and expulsion of the newborn.[\[13\]](#)

Figure 3.4 – delivery of the placenta and associated fetal membranes.[\[15\]](#)

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 3.5 – Natural childbirth. [17]

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 3.6 – A woman receiving a C-section. [18]



Figure 3.7 – A baby being delivered by C-section.

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)**.

THE NEWBORN



Figure 3.8 – A new mother holding her newborn. [21]

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.[\[22\]](#)
















EVENT MEDICINE EDUCATION PLANNING OPERATIONS		APGAR SCORE			
SCORE	APPEARANCE	PULSE	GRIMACE	ACTIVITY	RESPIRATION
0	 Blue all over	 No pulse	 No response to stimulation	 No movement	 No respiration
1	 Blue extremities	 <100 beats/min	 Grimace on stimulation	 Some flexion	 Weak, irregular, slow
2	 No blue colouration	 >100 beats/min	 Cry on stimulation	 Flexed limbs that resist extension	 Strong cry
<div> <div>≥7 NORMAL</div> <div>4-6 LOW</div> <div>≤3 CRITICAL</div> </div> <div>More FREE resources at eventmedicinegroup.org</div>					

Figure 3.9 – The Apgar assessment. [23]

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 3.10 – A medical professional performing the heel stick test.
[24]

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 3.11 – a premature baby on CPAP in the NICU. [26]

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 3.12 – This baby was born at 32 weeks and only weighed 2 pounds and 15 ounces. [27]

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 3.13 – A newborn being weighed. [29]

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!).

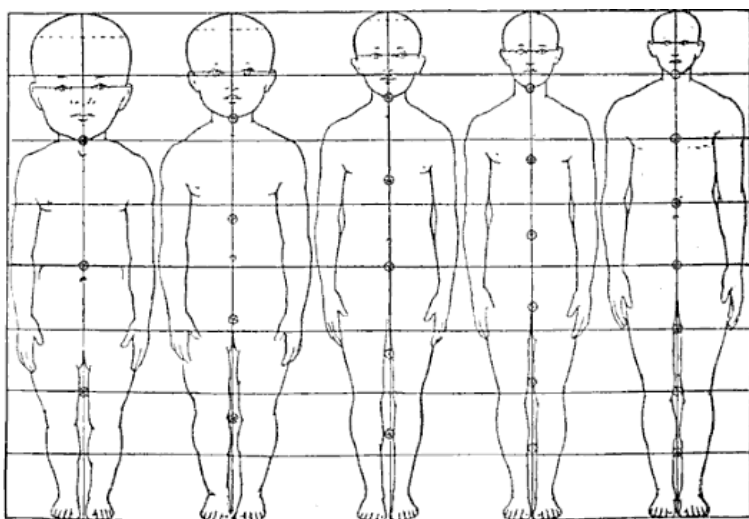


Figure 3.14 – Body proportions from infancy to adulthood. [30]

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 3.15 – Lanugo on the shoulder and back of twin girls. [32]



Figure 3.16 – A newborn baby

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 3.17 – The clamping and cutting of a newborn's umbilical cord.
[35]

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 3.18 – An older newborn baby. [38]

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 3.19 – A newborn gazing up at a parent. [40]

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 3.20 – A collection of children's books. [\[43\]](#)

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 3.21 – A baby sucking on a pacifier. [45]

Conclusion

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 (and the next unit), we will explore the first three years of life more. Many rapid changes occur during these foundational years. (The Infant-Toddler Unit)

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CHAPTER 4: PHYSICAL DEVELOPMENT IN INFANCY & TODDLERHOOD

Chapter Objectives

After this chapter, you should be able to:

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

INTRODUCTION

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.[\[1\]](#)



Figure 4.1 – A sleeping newborn. [2]

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.[\[3\]](#)

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.[\[4\]](#)



Figure 4.2 – An infant sleeping. [5]

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.

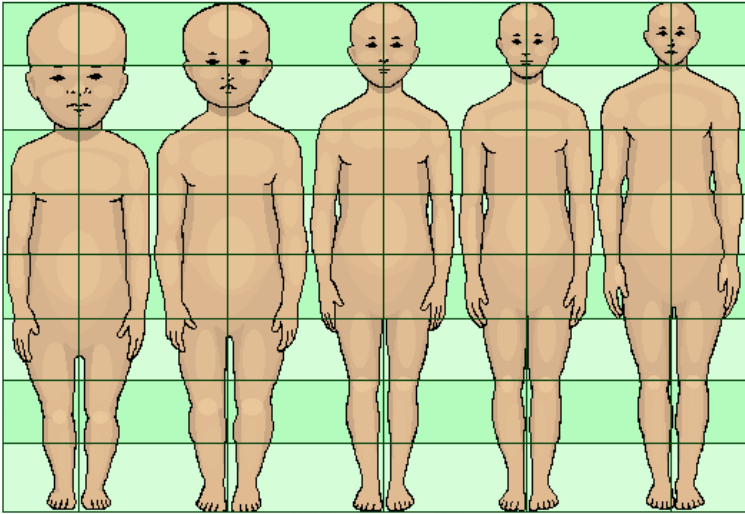


Figure 4.3 – Shown from left to right: Human body proportions at birth, at 2 years, at 6 years, at 12 years, and at 19 years. [6]

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.

Components of the Neuron

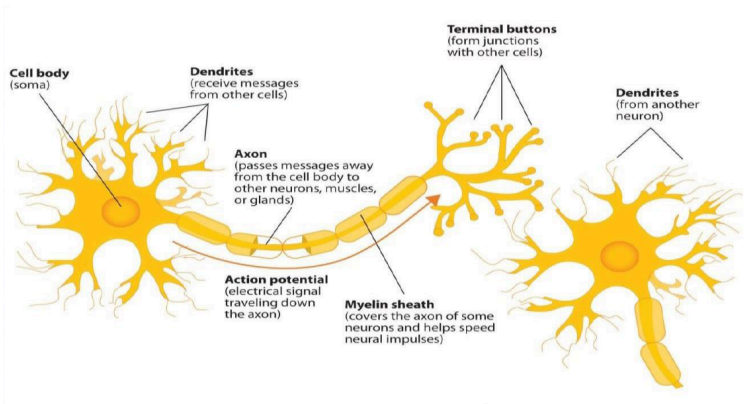


Figure 4.4 - The neuron. [7]

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.

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.[\[10\]](#)

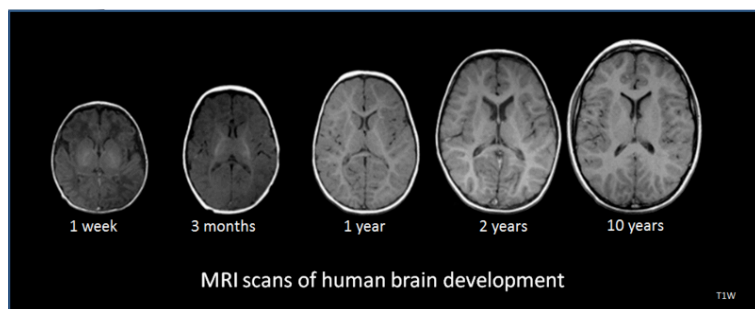


Figure 4.5 - MRI scans of the human brain. [\[11\]](#)







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 4.1 – Some Common Infant Reflexes[14]

Reflex	Description	Image	Reflex	Description	Image
Sucking	Suck on anything that touches the lips	 <i>Figure 4.6 [15]</i>	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	 <i>Figure 4.7 [16]</i>
Rooting	Turning the head when the cheek is touched	 <i>Figure 4.8 [17]</i>	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).	 <i>Figure 4.9 [18]</i>
Grasp	Fingers automatically grip anything that touches the palm of the hand	 <i>Figure 4.10 [19]</i>	Stepping	Legs move in stepping like motion when feet touch a smooth surface	 <i>Figure 4.11 [20]</i>

Reflex	Description	Image	Reflex	Description	Image
Babinski	The toes will fan out and curl when the sole of the foot is stroked from heel to toe				

Figure 4.12 [21]

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 pulling 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 4.2 – Gross Motor Milestones[\[24\]](#)

Typical Age	What Most Children Do by This Age
2 months	<p>Can hold head up and begins to push up when lying on tummy</p> <p>Makes smoother movements with arms and legs</p>
4 months	<p>Holds head steady, unsupported Pushes down on legs when feet are on a hard surface</p> <p>May be able to roll over from tummy to back</p> <p>Brings hands to mouth</p> <p>When lying on stomach, pushes up to elbows</p>
6 months	<p>Rolls over in both directions (front to back, back to front)</p> <p>Can sit with support</p> <p>When standing, supports weight on legs and might bounce</p> <p>Rocks back and forth, sometimes crawling backward before moving forward</p>
9 months	<p>Sits without support Creeps or crawls</p> <p>Stands, holding on</p> <p>Can get into sitting position</p> <p>Pulls to stand</p>
1 year	<p>Gets to a sitting position without help</p> <p>Pulls up to stand, walks holding on to furniture (“cruising”)</p> <p>May take a few steps without holding on</p> <p>May stand alone</p>

Typical Age	What Most Children Do by This Age
18 months	<ul style="list-style-type: none"> Walks alone May walk up steps and run Pulls toys while walking Can help undress self Stands on tiptoe Kicks a ball Begins to run
2 years	<ul style="list-style-type: none"> Climbs onto and down from furniture without help Walks up and down stairs holding on Throws ball overhand



Figure 4.13 – An infant playing in the sand. [25]

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.

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 grab it. This is quite a complicated set of actions if we remember how difficult this would have been just a few months earlier.[\[26\]](#)



Figure 4.14 – An infant feeding themselves. [27]

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 4.3 – Fine Motor Milestones[\[28\]](#)

Typical Age	What Most Children Do by This Age
2 months	<ul style="list-style-type: none"> Grasps reflexively Does not reach for objects Holds hands in fist Brings hands to mouth Uses hands and eyes together, such as seeing a toy and reaching for it
4 months	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Reaches with both arms Brings things to mouth Begins to pass things from one hand to the other
9 months	<ul style="list-style-type: none"> Puts things in mouth Moves things smoothly from one hand to the other Picks up things between thumb and index finger (pincer grip) Reaches with one hand Bangs two things together
1 year	<ul style="list-style-type: none"> Puts things in a container, takes things out of a container Lets things go without help Pokes with index (pointer) finger Scribbles on own Can help undress herself
18 months	<ul style="list-style-type: none"> Drinks from a cup Eats with a spoon with some accuracy Stacks 2-4 objects Builds towers of 4 or more blocks Might use one hand more than the other Makes copies of straight lines and circles
2 years	<ul style="list-style-type: none"> Enjoys pouring and filling Unbuttons large buttons Unzips large zippers Drinks and feeds self with more accuracy

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 4.15 – An infant looking up at the person feeding them. [29]

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 circumcisions.

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 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].

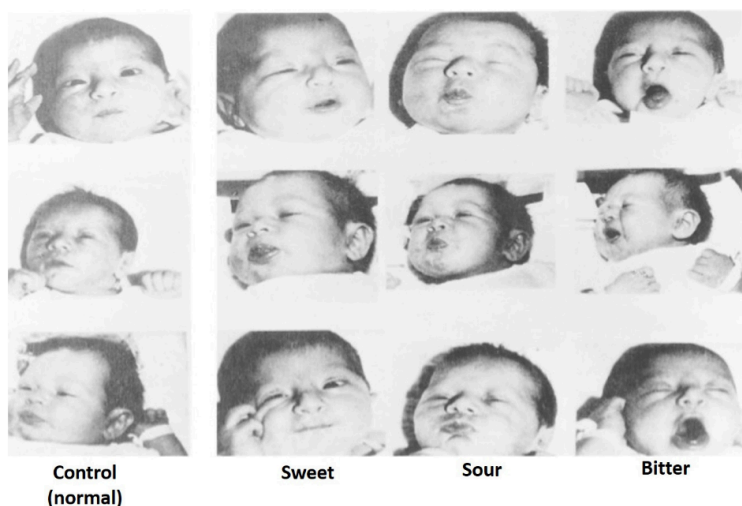


Figure 4.16 – The responses of infants to different tastes. [31]

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 4.17 – A nurse helping a new mother to breastfeed. [32]

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 proteins[34].



Figure 4.18 – A father bottle-feeding his infant. [35]

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 4.19 – A baby being fed solid food. [36]

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 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 4.4: Infant Meal Patterns[\[38\]](#)

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*
Lunch or Supper	4-6 fluid ounces breastmilk or formula	0-2 tablespoons vegetable, fruit, or both*
		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*
Snack	4-6 fluid ounces breastmilk or formula	0-2 tablespoons vegetable, fruit, or both*
		2-4 fluid ounces breastmilk or formula 0-½ 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 4.5: Meal Patterns for Children (1-2 years)[\[39\]](#)

Meal	Ages 1-2
Breakfast	½ cup milk
	¼ cup vegetables, fruit, or both
	½ ounce equivalent grains
Lunch or Supper	½ cup milk
	1 ounce meat or meat alternative
	1/8 cup vegetables
	1/8 cup fruits
	½ ounce equivalent of grains
	Select two of the following: ½ cup of milk
Snack	½ ounce meat or meat alternative
	½ cup vegetables
	½ cup fruit
	½ 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).

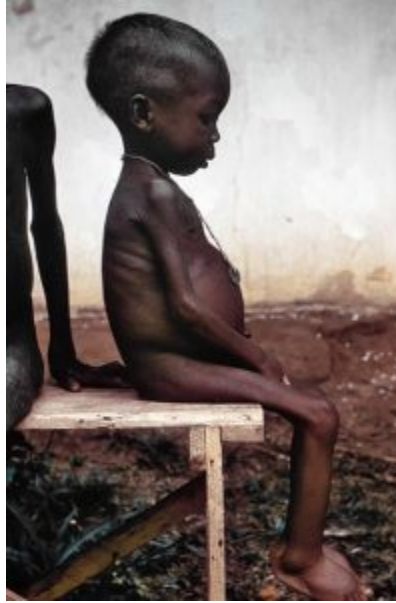


Figure 4.20 – A child suffering from wasting.
[40]

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.[\[43\]](#)

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 4.21 – An infant getting their diaper changed. [44]

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 4.22 – A father holding a crying infant. [45]

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 4.23 – Medical professionals caring for an infant. [48]

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 4.24 – A father holding his baby with a cloth protecting his shoulder from spit-up. [50]

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.

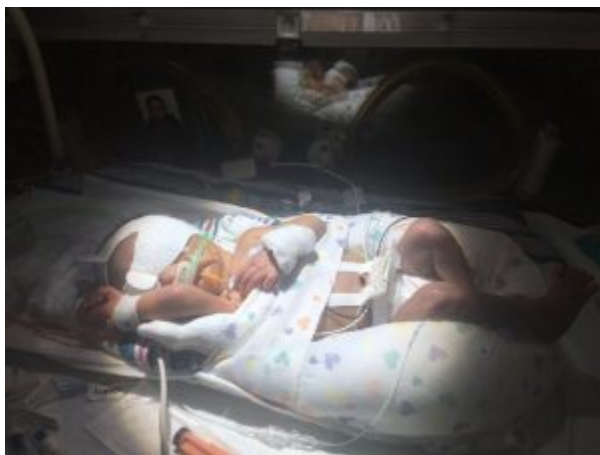


Figure 4.25 – An infant receiving treatment for jaundice. [51]

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 4.26 – A nurse giving an infant vaccinations. [52]

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 is 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 4.27 - These two young children contracted polio. [55]

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 4.28 – A baby with measles. [60]

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:

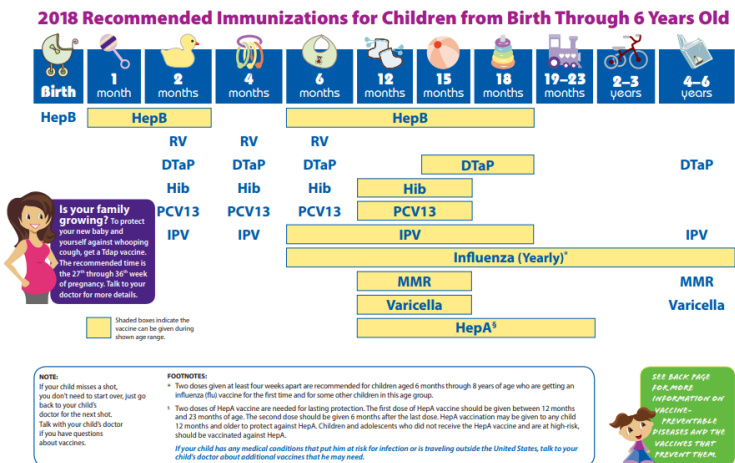


Figure 4.29 – Immunizations schedule. [64]

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 <i>Haemophilus influenzae</i> 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, pinkiey	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.

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Figure 4.30 – Vaccine-Preventable Diseases. [65]

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 for 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 for death and serious injury by approximately half.[68]

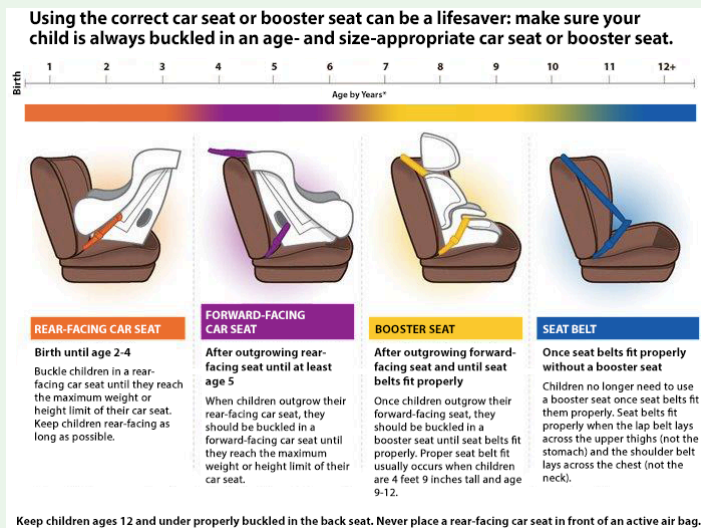


Figure 4.31 – The different types of car seats based on age. [69]

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 4.33 – A baby sleeping safely. [72]

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.

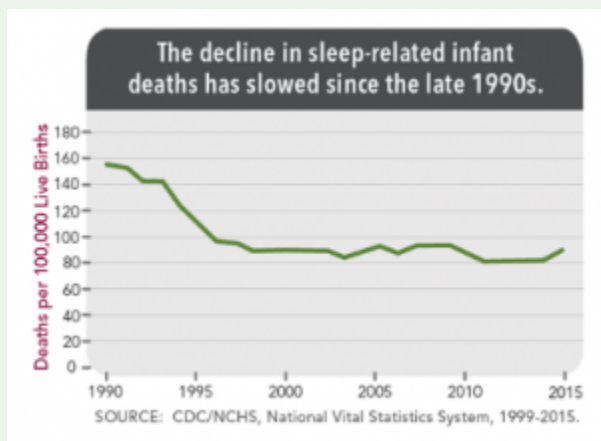


Figure 4.32 - A graph showing the decline in sleep-related infant deaths. [73]

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.[\[74\]](#)

Conclusion

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.

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CHAPTER 5: COGNITIVE DEVELOPMENT IN INFANCY AND TODDLERHOOD

Chapter Objectives

After this chapter, you should be able to:

- Describe the sub-stages of the Piaget's sensorimotor stage.
- Explain how the social environment affects cognitive development according to Vygotsky's theory.
- Discuss the progression of language development during the first two years.
- Compare the theories of language development.
- Define classical and operant conditioning.
- Summarize the different types of memory

INTRODUCTION

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.

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 – 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 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	Age	Description
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 – An infant sitting in a highchair. [3]

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).

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 – An adult playing Legos with a child. [5]

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 5.2 – Cognitive Milestones[\[6\]](#)

Typical Age	What Most Children Do by This Age
2 months	<p>Pays attention to faces</p> <p>Begins to follow things with eyes and recognize people at a distance</p> <p>Begins to act bored (cries, fussy) if activity doesn't change</p> <p>Lets you know if she is happy or sad</p> <p>Responds to affection</p> <p>Reaches for toy with one hand</p>
4 months	<p>Uses hands and eyes together, such as seeing a toy and reaching for it</p> <p>Follows moving things with eyes from side to side</p> <p>Watches faces closely</p> <p>Recognizes familiar people and things at a distance</p> <p>Looks around at things nearby</p> <p>Brings things to mouth</p>
6 months	<p>Shows curiosity about things and tries to get things that are out of reach</p> <p>Begins to pass things from one hand to the other</p> <p>Watches the path of something as it falls</p> <p>Looks for things he sees you hide</p>
9 months	<p>Plays peek-a-boo</p> <p>Puts things in mouth</p> <p>Moves things smoothly from one hand to the other</p> <p>Picks up things like cereal o's between thumb and index finger</p>

Typical Age	What Most Children Do by This Age
1 year	<p>Explores things in different ways, like shaking, banging, throwing</p> <p>Finds hidden things easily</p> <p>Looks at the right picture or thing when it's named</p> <p>Copies gestures</p> <p>Starts to use things correctly; for example, drinks from a cup, brushes hair</p> <p>Bangs two things together</p> <p>Puts things in a container, takes things out of a container</p> <p>Lets things go without help</p> <p>Pokes with index (pointer) finger</p> <p>Follows simple directions like "pick up the toy"</p> <p>Knows what ordinary things are for; for example, telephone, brush, spoon</p> <p>Points to get the attention of others</p> <p>Shows interest in a doll or stuffed animal by pretending to feed</p>
18 months	<p>Points to one body part</p> <p>Scribbles on own</p> <p>Can follow 1-step verbal commands without any gestures; for example, sits when you say "sit down"</p> <p>Finds things even when hidden under two or three covers</p> <p>Begins to sort shapes and colors</p> <p>Completes sentences and rhymes in familiar books</p> <p>Plays simple make-believe games</p>
2 years	<p>Builds towers of 4 or more blocks</p> <p>Might use one hand more than the other</p> <p>Follows two-step instructions such as "Pick up your shoes and put them in the closet."</p> <p>Names items in a picture book such as a cat, bird, or dog</p>

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 5.3 – An infant looking up at the camera. [7]

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 "nananananana".

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.”

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 – Two children playing with toys. [8]



Figure 5.5 – A toddler playing with a toy

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 5.3 – Language Milestones[\[11\]](#)

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 Responds to sounds by making sounds Strings vowels together when babbling (“ah,” “eh,” “oh”) and likes taking turns with parent while making sounds
6 months	Responds to own name Makes sounds to show joy and displeasure Begins to say consonant sounds (jabbering with “m,” “b”) Understands “no” Makes a lot of different sounds like “mamamama” and “bababababa”
9 months	Copies sounds and gestures of others Uses fingers to point at things Responds to simple spoken requests Uses simple gestures, like shaking head “no” or waving “bye-bye”
1 year	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 Points to things or pictures when they are named Knows names of familiar people and body parts Says sentences with 2 to 4 words
2 years	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 parent-ese (historically referred to as motherese). It involves speaking slowly, exaggerating the vowel and consonant sounds, using a high-pitched voice, simple vocabulary and short sentences, sometimes repeating words 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)[\[13\]](#).

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 key word 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).

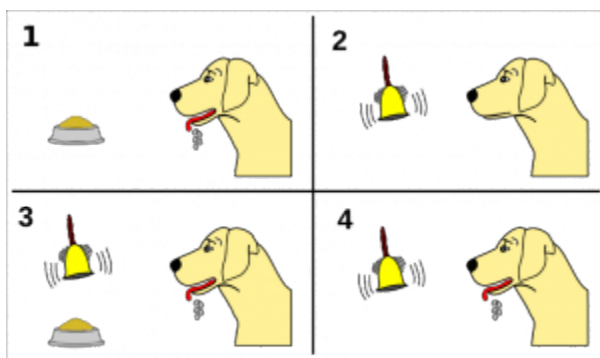


Figure 5.6 – Pavlov's experiments with dogs and conditioning. [14]

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.

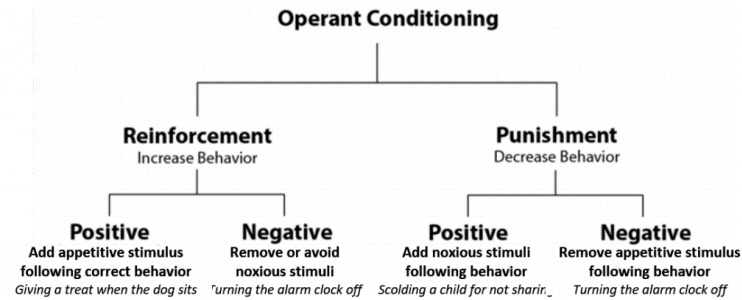


Figure 5.7 – Reinforcement in operant conditioning. [18]

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).

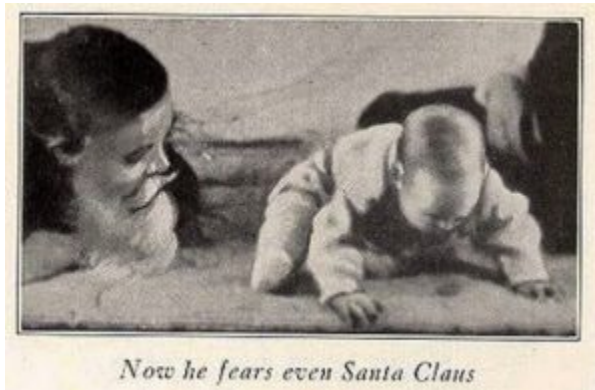


Figure 5.8 – A photograph taken during Little Albert research. [21]

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.

Parents may sometimes feel that all children do is take, take, take. But they are really giving their caregivers a huge gift; the honor of witnessing a developing personality. Through this experience, parents learn patience, empathy, become better problem-solvers and decision-makers and have the privilege of helping to raise another human being. Hopefully, they also begin to care about the future and want to make the world a better place for their children.



Figure 5.9 – A smiling infant playing with toys. [22]

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.

Memory and Attention

Memory

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 5.10 – A toddler walking. [23]

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.

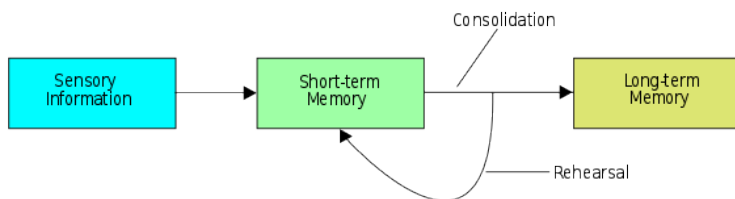


Figure 5.11 – Diagram of the memory storage process.[24]

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].

Conclusion

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.

References

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CHAPTER 6: SOCIAL AND EMOTIONAL DEVELOPMENT IN INFANCY AND TODDLERHOOD

Chapter Objectives

After this chapter, you should be able to:

- Classify types of temperament.
- Discuss the roles of culture and gender in socialization.
- Describe the sequence of emotional development during the first two years.
- Compare different theories of attachment and attachment styles.
- Explain Erikson's stages of trust versus mistrust and autonomy versus shame and doubt.
- Contrast child care options for families.

INTRODUCTION

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.

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:

1. activity level
2. rhythmicity (regularity of biological functions)
3. approach/withdrawal (how children deal with new things)
4. adaptability to situations
5. intensity of reactions
6. threshold of responsiveness (how intense a stimulus has to be for the child to react)
7. quality of mood
8. distractibility
9. attention span
10. persistence

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

Table 6.1 – 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 – This adventurous child’s parents provide a good “fit” to her temperament. [2]

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.

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 – A family from a non-Western culture. [4]

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 6.3 – A female infant wearing stereotypically feminine clothing and accessories. [\[6\]](#)



Figure 6.4 – A male infant wearing stereotypically masculine clothing.
[7]

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]

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 6.5 – An infant making an angry facial expression. [9]

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).

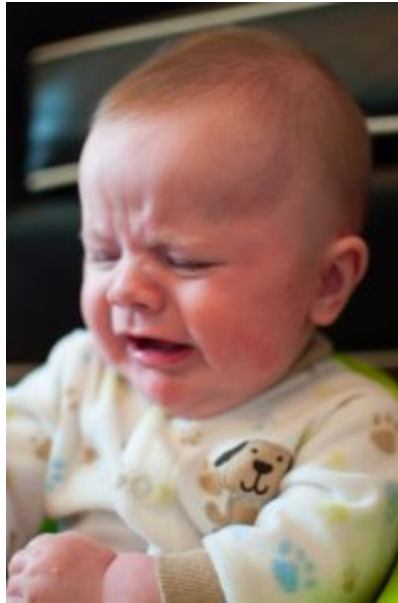


Figure 6.6 – An infant making a sad facial expression [10].

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 6.7 – A toddler at a park. [12]

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.[\[13\]](#)

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 6.2 – Social and Emotional Milestones[\[14\]](#)

Typical Age	What Most Children Do By This Age
2 months	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> May be afraid of strangers May be clingy with familiar adults Has favorite toys Is shy or nervous with strangers Cries when mom or dad leaves Has favorite things and people Shows fear in some situations
1 year	<ul style="list-style-type: none"> 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" Likes to hand things to others as play May have temper tantrums May be afraid of strangers
18 months	<ul style="list-style-type: none"> 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

Typical Age	What Most Children Do By This Age
	Copies others, especially adults and older children Gets excited when with other children
2 years	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

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 6.8 – The formation of attachment in action as a father snuggles a newborn. [15]

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 6.8 - A rhesus monkey sucking its thumb. [16]

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 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 6.9 – A mother offering a secure base as her infant plays on a slide. [17]

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 6.10 – This child is seeking comfort from an attachment figure. [18]

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 6.11 - This baby-wearing father is creating trust with his infant child. [19]

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.

Erikson: Autonomy vs. Shame and Doubt

As the child begins to walk and talk, an interest in independence or autonomy replaces a concern for trust. The toddler tests the limits of what can be touched, said, and explored. Erikson (1982) believed that toddlers should be allowed to explore their environment as freely as safety allows and in so doing will develop a sense of independence that will later grow to self-esteem, initiative, and overall confidence. If a caregiver is overly anxious about the toddler's actions for fear that the child will get hurt or violate other's expectation, the caregiver can give the child the message that he or she should be ashamed of their behavior and instill a sense of doubt in their own abilities. Parenting advice based on these ideas would be to keep your toddler safe, but let him or her learn by doing.

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 6.12 – An infant crawling on the floor with toys around as done in the Strange Situation. [20]

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 6.13 – This is a residential nursery in 1888. [21]

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 6.14 – This infant massage class for new mothers could provide training and support for mothers. [23]

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. [25]

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. [26]

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. [\[27\]](#)

Conclusion

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.

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CHAPTER 7: PHYSICAL DEVELOPMENT IN EARLY CHILDHOOD

Chapter Objectives

After this chapter, you should be able to:

- Describe the physical changes that occur in early childhood.
- Explain how to provide health nutrition for 3- to 5-year-olds.
- Summarize how to support the progression of motor skills with age appropriate activities.
- Discuss the sleep needs during early childhood and sleep disorders that may affect children.
- Explain the development behind toilet training and some elimination disorders that children may experience.
- Recognize the importance of awareness of sexual development in early childhood.
- Discuss risks to and a variety of ways to promote and protect children's health and safety.

INTRODUCTION

During the early childhood years of three to five we see significant changes in the way children look, think, communicate, regulate their emotions, and interact with others. Children are often referred to as preschoolers during

this time period. We'll examine the physical changes of the preschooler in this chapter.



Figure 7.1 – Two children walking across a bridge. [1]

GROWTH IN EARLY CHILDHOOD

Children between the ages of 2 and 6 years tend to grow about 3 inches in height each year and gain about 4 to 5 pounds in weight each year. The 3 year old is very similar to a toddler with a large head, large stomach, short arms and legs. But by the time the child reaches age 6, the torso has lengthened and body proportions have become more like those of adults. The average 6 year old weighs approximately 46 pounds and is about 46 inches in height. This growth rate is slower than that of infancy.

NUTRITIONAL CONCERNS

That slower rate of growth is accompanied by a reduced appetite between the ages of 2 and 6. This change can sometimes be surprising to parents and lead to the development of poor eating habits. However, children between the ages of 2 and 3 need 1,000 to 1,400 calories, while children between the ages of 4 and 8 need 1,200 to 2,000 calories (Mayo Clinic, 2016a).[\[2\]](#)

Caregivers who have established a feeding routine with their child can find the reduction in appetite a bit frustrating and become concerned that the child is going to starve. However, by providing adequate, sound nutrition, and limiting sugary snacks and drinks, the caregiver can be assured that 1) the child will not starve; and 2) the child will receive adequate nutrition. Preschoolers can experience iron deficiencies if not given well-balanced nutrition or if they are given too much milk as calcium interferes with the absorption of iron in the diet as well.

Caregivers need to keep in mind that they are setting up taste preferences at this age. Children's food preferences are influenced by what they see on television, what their friends eat, as well as their family's cultural preferences. Young children who grow accustomed to high fat, very sweet and salty flavors may have trouble eating foods that have more subtle flavors such as fruits and vegetables. Consider the following advice about establishing eating patterns for years to come (Rice, F.P., 1997). Notice that keeping mealtime pleasant, providing sound nutrition and not engaging in power struggles over food are the main goals.[\[3\]](#)

TIPS FOR ESTABLISHING HEALTHY EATING HABITS

Don't try to force your child to eat or fight over food. Of course, it is impossible to force someone to eat. But the real advice here is to avoid turning food into a power struggle so that food doesn't become a way to gain favor with or express anger toward someone else.

Recognize that appetite varies. Children may eat well at one meal and have no appetite at another. Rather than seeing this as a problem, it may help to realize that appetites do vary. Continue to provide good nutrition at each mealtime (even if children don't choose to eat the occasional meal).

Keep it pleasant. This tip is designed to help caregivers create a positive atmosphere during mealtime. Mealtimes should not be the time for arguments or expressing tensions. You do not want the child to have painful memories of mealtimes together or have nervous stomachs and problems eating and digesting food due to stress.

No short order chefs. While it is fine to prepare foods that children enjoy, preparing a different meal for each child or family member sets up an unrealistic expectation from others. Children probably do best when they are hungry and a meal is ready. Limiting snacks rather than allowing children to “graze” continuously can help create an appetite for whatever is being served.

Limit choices. If you give your preschool aged child choices, make sure that you give them one or two specific choices rather than asking “What would you like for lunch?” If given an open choice, children may change their minds or choose whatever their sibling does not choose!

Serve balanced meals. Meals prepared at home tend to have better nutritional value than fast food or frozen dinners. Prepared foods tend to be higher in fat and sugar content as these ingredients enhance taste and profit margin because fresh food is often more costly and less profitable. However, preparing fresh food at home is not costly. It does, however, require more activity. Including children in meal preparation can provide a fun and memorable experience.

Don’t bribe. Bribing a child to eat vegetables by promising dessert is not a good idea. First, the child will likely find a way to get the dessert without eating the vegetables (by whining or fidgeting, perhaps, until the caregiver gives in). Secondly, it teaches the child that some foods are better than others. Children tend to naturally enjoy a variety of foods until they are taught that some are considered less desirable than others.

A child, for example, may learn the broccoli they have enjoyed is seen as yucky by others unless it's smothered in cheese sauce![\[4\]](#)



Figure 7.2 – Two children cooking together. [\[5\]](#)

USDA Meal Patterns for Young Children

The United States Department of Agriculture Food and Nutrition Service provides the following guidance for the daytime feeding of children age 3 to 5.

Table 7.1:

Meal	Ages 3-5
Breakfast	3/4 cup milk
	1/2 cup vegetables, fruit, or both
	1/2 ounce equivalent grains
Lunch or Supper	3/4 cup milk
	1 1/2 ounces meat or meat alternative
	1/4 cup vegetables
	1/4 cup fruits
	1/2 ounce equivalent of grains
	<i>Select two of the following:</i>
Snack	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

BRAIN MATURATION

Brain Weight

The brain is about 75 percent its adult weight by two years of age. By age 6, it is approximately 95 percent its adult weight. Myelination and the development of dendrites continues to occur in the cortex and as it does, we see a corresponding change in the child's abilities. Significant development in the **prefrontal cortex** (the area of the brain behind the forehead that helps us to think, strategize, and control emotion) makes it increasingly possible to control emotional outbursts and to understand how to play games. Consider 4- or 5-year-old children and how they might approach a game of soccer. Chances are, every move would be a response to the commands of a coach standing nearby calling out, "Run this way! Now, stop. Look at the ball. Kick the ball!" And when the child is not being told what to do, he or she is likely to be looking at the clover on the ground or a dog on

the other side of the fence! Understanding the game, thinking ahead, coordinating movement, and handling losing improve with practice and myelination.[7]

Visual Pathways

Children's drawings are representative of the development of visual pathways; as children's brains mature the images in their drawings change. Early scribbles and dots illustrate the use of simple motor skills. No real connection is made between an image being visualized and what is created on paper.

At age 3, the child begins to draw wispy creatures with heads and not much other detail. Gradually pictures begin to have more detail and incorporate more parts of the body. Arm buds become arms and faces take on noses, lips and eventually eyelashes.



Figure 7.3 – Early scribbles. [8]

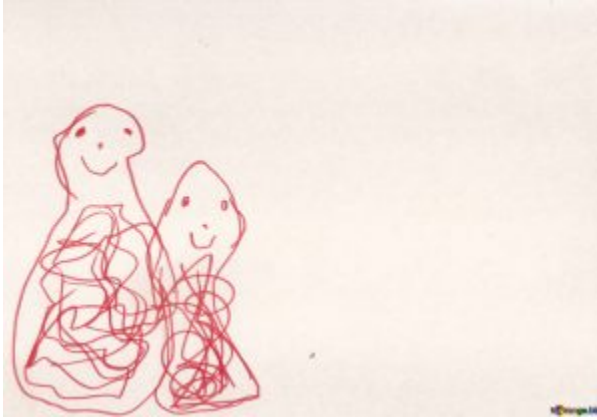


Figure 7.4 – Creatures with heads. [9]



Figure 7.5 – A detailed face. [10]

Growth in the Hemispheres and Corpus Callosum

Between ages 3 and 6, the left hemisphere of the brain grows dramatically. This side of the brain or hemisphere is typically involved in language skills. The right hemisphere continues to grow throughout early childhood and is involved in tasks that require spatial skills such as recognizing shapes and patterns. The **corpus callosum** which connects the two hemispheres of the brain undergoes a growth spurt between ages 3 and 6 and results in improved coordination between right and left hemisphere tasks.

MOTOR SKILL DEVELOPMENT

Early childhood is a time when children are especially attracted to motion and song. Days are filled with jumping, running, swinging and clapping and every place becomes a playground. Even the booth at a restaurant affords the opportunity to slide around in the seat or disappear underneath and imagine being a sea creature in a cave! Of course, this can be frustrating to a caregiver, but it's the business of early childhood.

Gross Motor Skills

Children continue to improve their gross motor skills as they run and jump. They frequently ask their caregivers to "look at me" while they hop or roll down a hill. Children's songs are often accompanied by arm and leg movements or cues to turn around or move from left to right.

Gross Motor Milestones

Here is a table showing the progression of gross motor skills that children will typically develop during early childhood:

Table 7.2 – Gross Motor Milestones[\[11\]](#)

Typical Age	What Most Children Do by This Age
3 years	Climbs well
	Runs easily
	Pedals a tricycle (3-wheel bike)
4 years	Walks up and down stairs, one foot on each step
	Hops and stands on one foot up to 2 seconds
	Catches a bounced ball most of the time
5 years	Stands on one foot for 10 seconds or longer
	Hops; may be able to skip
	Can do a somersault
	Can use the toilet on own
	Swings and climbs

Activities to Support Gross Motor Skills

Here are some activities focused on play that young children enjoy and that support their gross motor skill development.

- Tricycle
- Slides
- Swings
- Sit-n-Spin
- Mini trampoline
- Bowling pins (can use plastic soda bottles also)
- Tent (try throwing blankets over chairs and other furniture to make a fort)

- Playground ladders
- Suspension bridge on playground
- Tunnels (try throwing a bean bag chair underneath for greater challenge)
- Ball play (kick, throw, catch)
- Simon Says
- Target games with bean bags, ball, etc.
- Dancing/moving to music
- Pushing self on scooter or skateboard while on stomach



Figure 7.6 – Children riding tricycles together. [12]

Fine Motor Skills

Fine motor skills are also being refined as they continue to develop more dexterity, strength, and endurance. Fine motor skills are very important as they are foundational to self-help skills and later academic abilities (such as writing).

Fine Motor Milestones

Here is a table showing how fine motor skills progress during early childhood for children that are typically developing.

Table 7.3 – Fine Motor Milestones[\[13\]](#)

Typical Age	What Most Children Do by This Age
3 years	Copies a circle with pencil or crayon Turns book pages one at a time
	Builds towers of more than 6 blocks
	Screws and unscrews jar lids or turns door handle
4 years	Pours, cuts with supervision, and mashes own food Draws a person with 2 to 4 body parts
	Uses scissors
	Starts to copy some capital letters
5 years	Can draw a person with at least 6 body parts Can print some letters or numbers
	Copies a triangle and other geometric shapes
	Uses a fork and spoon and sometimes a table knife

Activities to Support Fine Motor Skills

Here are some fun activities that will help children continue to refine their fine motor abilities. Fine motor skills are slower to develop than gross motor skills, so it is important to have age appropriate expectations and play-based activities for children.

- Pouring water into a container
- Drawing and coloring
- Using scissors
- Finger painting
- Fingerplays and songs (such as the Itsy, Bitsy Spider)
- Play dough
- Lacing and beading
- Practicing with large tweezers, tongs, and eye droppers



Figure 7.7 – Children coloring. [14]

SLEEP AND EARLY CHILDHOOD

Along with food and water, sleep is one of the human body's most important physiological needs—we cannot live without it. Extended sleeplessness (i.e., lack of sleep for longer than a few days) has severe psychological and physical effects. Research on rats has found that a week of no sleep leads to loss of immune function, and two weeks of no sleep leads to death.

Recently, neuroscientists have learned that at least one vital function of sleep is related to learning and memory. New findings suggest that sleep plays a critical role in flagging and storing important memories, both intellectual and physical, and perhaps in making subtle connections that were invisible during waking hours.[\[15\]](#)

How Much Sleep Do We Need?

The amount of sleep an individual needs varies depending on multiple factors including age, physical condition, psychological condition, and energy exertion. Just like any other human characteristic, the amount of sleep people need to function best differs among individuals, even those of the same age and gender.

Though there is no magic sleep number, there are general rules for how much sleep certain age groups need. For instance, children need more sleep per day in order to develop and function properly: up to 18 hours for newborn babies, with a declining rate as a child ages. A newborn baby spends almost 9 hours a day in REM sleep. By the age of five, only slightly over two hours is spent in REM. Studies show that young children need about 10 to 11 hours of sleep, adolescents need between 8.5 and 9.25, and adults generally need between 7 and 9 hours.



Figure 7.8 – A child sleeping. [16]

Sleepwalking (Somnambulism)

Sleepwalking (sometimes called sleepwalking disorder, **somnambulism**, or noctambulation) causes a person to get up and walk during the early hours of sleep. The person may sit up and look awake (though they're actually asleep), get up and walk around, move items, or dress or undress themselves. They will have a blank stare and still be able to perform complex tasks. Some individuals also talk while in their sleep, saying meaningless words and even having arguments with people who are not there. A person who sleepwalks will be confused upon waking up and may also experience anxiety and fatigue.

Sleepwalking can be dangerous—people have been known to seriously hurt themselves during sleepwalking episodes. It is most common in children, but it also occurs occasionally in adults. For adults, alcohol, sedatives, medications, medical conditions and mental disorders are all associated with sleepwalking.

Sleep Terrors and Nightmare Disorder

Sleep terrors are characterized by a sudden arousal from deep sleep with a scream or cry, accompanied by some behavioral manifestations of intense fear. Sleep terrors typically occur in the first few hours of sleep, during stage 3 NREM sleep. Night terrors tend to happen during periods of arousal from delta sleep (i.e., slow-wave sleep). They are worse than nightmares, causing significant disorientation, panic, and anxiety. They can last up to 10 minutes, and the person may be screaming and difficult to wake. In some cases, sleep terrors continue into adulthood.

Distinct from sleep terrors is nightmare disorder. Also known as “dream anxiety disorder,” nightmare disorder is characterized by frequent nightmares. The nightmares, which often portray the individual in a situation that jeopardizes their life or personal safety, usually occur during the second half of the sleeping process, called the REM stage. Though many people experience nightmares, those with nightmare disorder experience them more frequently.[\[17\]](#)

TOILET TRAINING

Toilet training typically occurs after the second birthday. Some children show interest by age 2, but others may not be ready until months later. The average age for girls to be toilet trained is 29 months and for boys it is 31 months, and 98% of children are trained by 36 months (Boyse & Fitzgerald, 2010). The child’s age is not as important as his/her physical and emotional

readiness. If started too early, it might take longer to train a child.

According to The Mayo Clinic (2016b) the following questions can help parents (or ECE teachers) determine if a child is ready for toilet training:

- Does the child seem interested in the potty chair or toilet, or in wearing underwear?
- Can the child understand and follow basic directions?
- Does the child tell you through words, facial expressions or posture when he or she needs to go?
- Does the child stay dry for periods of two hours or longer during the day?
- Does the child complain about wet or dirty diapers?
- Can the child pull down his or her pants and pull them up again?
- Can the child sit on and rise from a potty chair?

If a child resists being trained or it is not successful after a few weeks, it is best to take a break and try again when they show more significant interest in the process. Most children master daytime bladder control first, typically within two to three months of consistent toilet training. However, nap and nighttime training might take months or even years.



Figure 7.9 – A child learning to be toilet trained. [18]

Elimination Disorders

Some children experience elimination disorders including:

- **enuresis** – the repeated voiding of urine into bed or clothes (involuntary or intentional) after age 5
- **encopresis** – the repeated passage of feces into inappropriate places (involuntary or intentional).

The prevalence of enuresis is 5%-10% for 5 year-olds, 3%-5% for 10 year-olds and approximately 1% for those 15 years of age or older. Around 1% of 5 year-olds have encopresis, and it is more common in males than females. These are diagnosed by a medical professional and may require treatment.[\[19\]](#)

SEXUAL DEVELOPMENT IN EARLY CHILDHOOD

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

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

Caregivers should respond to this without undue alarm and without making the child feel guilty about their bodies. Instead, messages about what is going on and the appropriate time and place for such activities help the child learn what is appropriate.[\[20\]](#)

HEALTH IN EARLY CHILDHOOD

While preschoolers are becoming more and more independent, they depend on their caregivers to keep protecting and promoting their health. [\[21\]](#)

Childhood Obesity

Childhood obesity is a complex health issue. It occurs when a child is well above the normal or healthy weight for his or her age and height. Childhood obesity is a serious problem in

the United States putting children at risk for poor health. In 2015-2016, 13.9% of 2- to 5-year-olds were obese.

Where people live can affect their ability to make healthy choices. Obesity disproportionately affects children from low-income families.

Causes of Obesity

The causes of excess weight gain in young people are similar to those in adults, including factors such as a person's behavior and genetics. Behaviors that influence excess weight gain include:

- eating high calorie, low-nutrient foods
- not getting enough physical exercise
- sedentary activities (such as watching television or other screen devices)
- medication use
- sleep routines



Figure 7.10 – A child watching TV instead of playing. [22]

Consequences of Obesity

The consequences of childhood obesity are both immediate and long term. It can affect physical as well as social and emotional well-being.

- More Immediate Health Risks
 - High blood pressure and high cholesterol, which are risk factors for cardiovascular disease (CVD).
 - Increased risk of impaired glucose tolerance, insulin resistance, and type 2 diabetes.
 - Breathing problems, such as asthma and sleep apnea.
 - Joint problems and musculoskeletal discomfort.
 - Fatty liver disease, gallstones, and gastro-esophageal reflux (i.e., heartburn).
- Childhood obesity is also related to
 - Psychological problems such as anxiety and depression.
 - Low self-esteem and lower self-reported quality of life.
 - Social problems such as bullying and stigma.
- Future Health Risks
 - Children who have obesity are more likely to become adults with obesity.¹¹ Adult obesity is associated with increased risk of a number of serious health conditions including heart disease, type 2 diabetes, and cancer.
 - If children have obesity, their obesity and disease risk factors in adulthood are likely to be more severe.[\[23\]](#)

Food Allergies

A **food allergy** occurs when the body has a specific and reproducible immune response to certain foods. The body's immune response can be severe and life threatening, such as anaphylaxis. Although the immune system normally protects people from germs, in people with food allergies, the immune system mistakenly responds to food as if it were harmful.

Eight foods or food groups account for 90% of serious allergic reactions in the United States: milk, eggs, fish, crustacean shellfish, wheat, soy, peanuts, and tree nuts.

The symptoms and severity of allergic reactions to food can be different between individuals, and can also be different for one person over time. Anaphylaxis is a sudden and severe allergic reaction that may cause death.⁴ Not all allergic reactions will develop into anaphylaxis.

- Children with food allergies are two to four times more likely to have asthma or other allergic conditions than those without food allergies.
- The prevalence of food allergies among children increased 18% during 1997-2007, and allergic reactions to foods have become the most common cause of anaphylaxis in community health settings.
- Although difficult to measure, research suggests that approximately 4% of children and adolescents are affected by food allergies.

The CDC recommends that as part of maintaining a healthy and safe environment for children, caregivers should:

- Be aware of any food allergies.
- Educate other children and all adults that care for a child with food allergies.
- Ensure the daily management of food allergies.

- Prepare for food allergy emergencies.[\[24\]](#)

Oral Health

Tooth decay (cavities) is one of the most common chronic conditions of childhood in the United States. Untreated tooth decay can cause pain and infections that may lead to problems with eating, speaking, playing, and learning. The good news is that tooth decay is preventable.

Fluoride varnish, a high concentration fluoride coating that is painted on teeth, can prevent about one-third (33%) of decay in the primary (baby) teeth. Children living in communities with fluoridated tap water have fewer decayed teeth than children who live in areas where their tap water is not fluoridated. Similarly, children who brush daily with fluoride toothpaste will have less tooth decay.

Applying dental sealants to the chewing surfaces of the back teeth is another way to prevent tooth decay. Studies in children show that sealants reduce decay in the permanent molars by 81% for 2 years after they are placed on the tooth and continue to be effective for 4 years after placement.[\[25\]](#)

The first visit to the dentist should happen after the first tooth erupts. After that, children should be seeing the dentist every six months.[\[26\]](#)



Figure 7.11 – A dentist checking a child's teeth. [27]

Protection from Illness

Two important ways to help protect children from illness are immunization and handwashing.

Immunizations

While vaccines begin in infancy, it is important for children to receive additional doses of vaccines to keep them protected. These boosters, given between ages 4 and 6, are doses of the vaccines they received earlier in life to help them maintain the best protection against vaccine-preventable diseases.



Figure 7.12 – Vaccines. [28]

Many states require children to be fully vaccinated (unless they have a medical reason to be exempt) before they can enroll in licensed child care or public school. If vaccinations were missed, a health care provider can help the child's caregivers to create a catch up schedule to ensure the child correctly "catches up" with the recommended childhood vaccination schedule.[\[29\]](#)

Handwashing

Handwashing is one of the best ways to prevent the spread of illness. It's important for children (and adults) to wash their hands often, especially when they are likely to get and spread germs, including:

- Before, during, and after preparing food.
- Before eating food.
- After blowing nose, coughing, or sneezing.
- After using the toilet.
- After touching an animal, animal feed, or animal waste.
- After touching garbage.

It's important for children to learn how to properly wash their hands. When washing hands children (and adults) should follow these five steps every time.

1. Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. Scrub your hands for at least 20 seconds. Need a timer? Hum or sing the *Happy Birthday* song or *ABCs* from beginning to end twice.
4. Rinse your hands well under clean, running water.

5. Dry your hands using a clean towel or air dry them.[\[30\]](#)



Figure 7.13 – A mother helping her son wash his hands. [31]

Caregivers can help keep children healthy by:

- Teaching them good handwashing techniques.
- Reminding their kids to wash their hands.
- Washing their own hands with the children.[\[32\]](#)

SAFETY

Child injuries are preventable, yet more than 9,000 children (from 0-19 years) died from injuries in the US in 2009. Car crashes, suffocation, drowning, poisoning, fires, and falls are some of the most common ways children are hurt or killed. The number of children dying from injury dropped nearly 30% over the last decade. However, injury is still the number 1 cause of death among children.[\[33\]](#)

Children during early childhood are more at risk for certain injuries. Using data from 2000-2006, the CDC determined that:

- Drowning was the leading cause of injury death between 1 and 4 years of age.
- Falls were the leading cause of nonfatal injury for all age groups less than 15.

- For children ages 0 to 9, the next two leading causes were being struck by or against an object and animal bites or insect stings.
- Rates for fires or burns, and drowning were highest for children 4 years and younger.[\[34\]](#)

Here is a table summarizing some tips from the CDC to protect children from these injuries:

Table 7.4 – Preventing Injuries

Type of Injury	Prevention Tips
	Have smoke alarms on every floor and in all rooms people sleep in Involve children in creating and practicing an escape plan
Burns	Never leave food cooking on the stove unattended; supervise any use of microwave Make sure the water heater is set to 120 degrees or lower [35] Make sure caregivers are trained in CPR Fence off pools; gates should be self-closing and self-latching
Drowning	Have children wear life jackets in and around natural bodies of water Supervise children in or near water (including the bathtub) [36] Make sure playground surfaces are safe, soft, and made of impact absorbing material (such as wood chips or sand) at an appropriate depth and are well maintained Use safety devices (such as window guards)
Falls	Make sure children are wearing protective gear during sports and recreation (such as bicycle helmets) Supervise children around fall hazards at all times [37] Lock up all medications and toxic products (such as cleaning solutions and detergents) in original packaging out of sight and reach of children Know the number to poison control (1-800-222-1222)
Poisoning	Read and follow labels of all medications Safely dispose of unused, unneeded, or expired prescription drugs and over the counter drugs, vitamins, and supplements [38]
Motor-accident, in vehicle	Children should still be safely restrained in a five point harnessed car seat Children should be in back seat Children should not be seated in front of an airbag

Type of Injury	Prevention Tips
Motor-accident, pedestrian	Teach children about safety including: Walking on the sidewalk
	Not assuming vehicles see you or will stop
	Crossing only in crosswalks
	Looking both ways before crossing
	Never playing in the road
	Not crossing a road without an adult
	Supervise children near all roadways and model safe behavior [39]



Figure 7.14 – Children playing on a jungle gym at a park. [40]

Conclusion

In this chapter we looked at:

- The physical characteristics of preschoolers.
- Healthy nutrition.
- The changes in the brain.
- The progression of motor skills and developmentally appropriate ways to support that development.

- Sleep and sleep disorders.
- Toilet training and elimination disorders
- Sexual development in early childhood.
- And ways to keep children healthy and safe.

In the next chapter we'll investigate how children understand the world and their communication abilities.

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CHAPTER 8: COGNITIVE DEVELOPMENT IN EARLY CHILDHOOD

Chapter Objectives

After reading this chapter, you should be able to:

1. Compare and contrast Piaget and Vygotsky's beliefs about cognitive development.
2. Explain the role of information processing in cognitive development.
3. Discuss how preschool-aged children understand their worlds.
4. Put cognitive and language milestones into the order in which they appear in typically developing children.
5. Discuss how early child education supports development and how our understanding of development influence education.
6. Describe autism spectrum disorder, including characteristics and possible interventions.

INTRODUCTION

Early childhood is a time of pretending, blending fact and fiction, and learning to think of the world using language. As young children move away from needing to touch, feel, and hear about the world toward learning some basic principles about how the world works, they hold some pretty interesting

initial ideas. For example, while adults have no concerns with taking a bath, a child of three might genuinely worry about being sucked down the drain.[\[1\]](#)



Figure 8.1 – A child in a bathtub. [2]

A child might protest if told that something will happen “tomorrow” but be willing to accept an explanation that an event will occur “today after we sleep.” Or the young child may ask, “How long are we staying? From here to here?” while pointing to two points on a table. Concepts such as tomorrow, time, size and distance are not easy to grasp at this young age. Understanding size, time, distance, fact and fiction are all tasks that are part of cognitive development in the preschool years.[\[3\]](#)

PIAGET’S PREOPERATIONAL INTELLIGENCE

Piaget’s stage that coincides with early childhood is the **preoperational stage**. The word operational means logical, so these children were thought to be illogical. However, they were learning to use language or to think of the world symbolically. Let’s examine some of Piaget’s assertions about children’s cognitive abilities at this age.

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!



Figure 8.2 – A child pretending to buy items at a toy grocery store. [4]

According to Piaget, children's pretend play helps them solidify new schemes they were developing cognitively. This play, then, reflects 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).

Egocentrism

Egocentrism in early childhood refers to the tendency of young children to think that everyone sees things in the same way as the child. Piaget's classic experiment on egocentrism involved showing children a 3-dimensional model of a mountain and asking them to describe what a doll that is looking at the mountain from a different angle might see. Children tend to choose a picture that represents their own view, rather than that of the doll. However, children 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 8.3 – Piaget's egocentrism experiment. [5]

Syncretism

Syncretism refers to a tendency to think that if two events occur simultaneously, one caused the other. An example of this is a child putting on their bathing suit to turn it to summertime.

Animism

Attributing lifelike qualities to objects is referred to as **animism**. 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 3, they seldom refer to objects as being alive (Berk, 2007).

Classification Errors

Preoperational children 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. As the child's vocabulary improves and more schemes are developed, the ability to classify objects improves.[\[6\]](#)

Conservation Errors

Conservation refers to the ability to recognize that moving or rearranging matter does not change the quantity. Let's look at an example. A father 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**, or focused on only one characteristic of an object to the exclusion of others.

Kenny focused on the five pieces of pizza to his sister's one piece even though the total amount 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.

The classic Piagetian experiment associated with conservation involves liquid (Crain, 2005). As seen below, the child is shown two glasses (as shown in a) 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 researcher then pours the liquid from one glass to a taller and thinner glass (as shown in b). 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. The

child has concentrated on the height of the glass and fails to conserve.[7]



Figure 8.4 - Piagetian liquid conservation experiments. [8]

Cognitive Schemas

As introduced in the first chapter, Piaget believed that in a quest for cognitive equilibrium, we use schemas (categories of knowledge) to make sense of the world. And when new experiences fit into existing schemas, we use assimilation to add that new knowledge to the schema. But when new experiences do not match an existing schema, we use accommodation to add a new schema. During early childhood, children use accommodation often as they build their understanding of the world around them.

VYGOTSKY'S SOCIOCULTURAL THEORY OF COGNITIVE DEVELOPMENT

As introduced in Chapter 1, Lev Vygotsky was a Russian psychologist who argued that culture has a major impact on a child's cognitive development. He believed that the social interactions with adults and more knowledgeable peers can facilitate a child's potential for learning. Without this interpersonal instruction, he believed children's minds would not advance very far as their knowledge would be based only on their own discoveries. Let's review some of Vygotsky's key concepts.

Zone of Proximal Development and Scaffolding

Vygotsky's best known concept is the zone of proximal development (ZPD). Vygotsky stated that children should be taught in the ZPD, which occurs when they can perform a task with assistance, but not quite yet on their own. With the right kind of teaching, however, they can accomplish it successfully. A good teacher identifies a child's ZPD and helps the child stretch beyond it. Then the adult (teacher) gradually withdraws support until the child can then perform the task unaided. Researchers have applied the metaphor of scaffolds (the temporary platforms on which construction workers stand) to this way of teaching. Scaffolding is the temporary support that parents or teachers give a child to do a task.

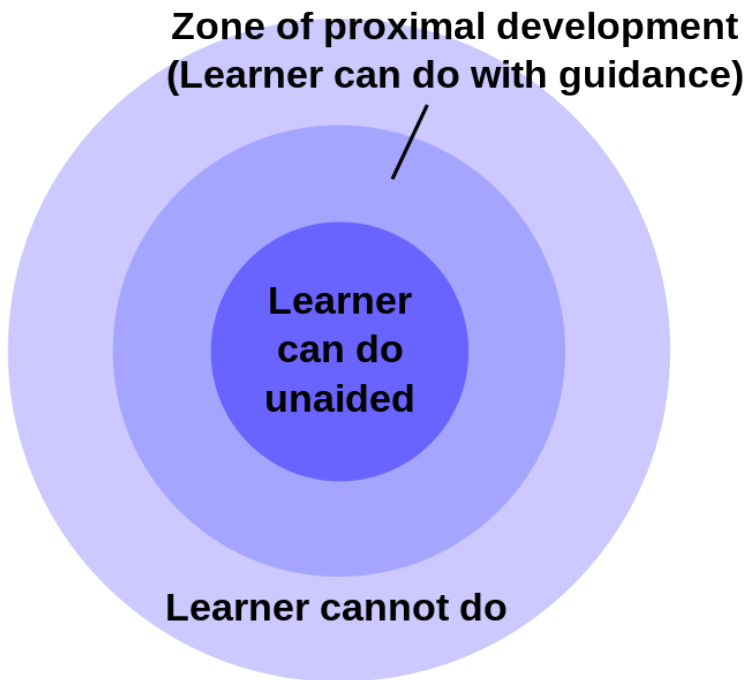


Figure 8.5 – Zone of proximal development. [9]

Private Speech

Do you ever talk to yourself? Why? Chances are, this occurs when you are struggling with a problem, trying to remember something, or feel very emotional about a situation. Children talk to themselves too. Piaget interpreted this as **egocentric speech** or a practice engaged in because of a child's inability to see things from another's point of view. Vygotsky, however, believed that children talk to themselves in order to solve problems or clarify thoughts. As children learn to think in words, they do so aloud before eventually closing their lips and engaging in **private speech** or inner speech.

Thinking out loud eventually becomes thought accompanied by internal speech, and talking to oneself becomes a practice only engaged in when we are trying to learn something or remember something. This inner speech is not as elaborate as the speech we use when communicating with others (Vygotsky, 1962).[\[10\]](#)

Contrast with Piaget

Piaget was highly critical of teacher-directed instruction, believing that teachers who take control of the child's learning place the child into a passive role (Crain, 2005). Further, teachers may present abstract ideas without the child's true understanding, and instead they just repeat back what they heard. Piaget believed children must be given opportunities to discover concepts on their own. As previously stated, Vygotsky did not believe children could reach a higher cognitive level without instruction from more learned individuals. Who is correct? Both theories certainly contribute to our understanding of how children learn.

INFORMATION PROCESSING

Information processing researchers have focused on several issues in cognitive development for this age group, including improvements in attention skills, changes in the capacity, and the emergence of executive functions in working memory. Additionally, in early childhood memory strategies, memory accuracy, and autobiographical memory emerge. Early childhood is seen by many researchers as a crucial time period in memory development (Posner & Rothbart, 2007).

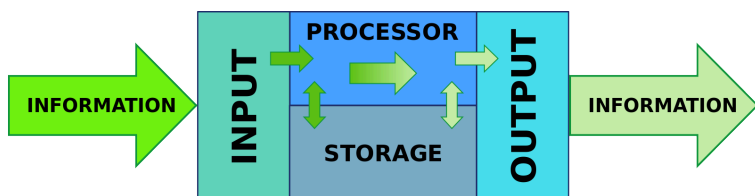


Figure 8.6 - How information is processed. [11]

Attention

Changes in attention have been described by many as the key to changes in human memory (Nelson & Fivush, 2004; Posner & Rothbart, 2007). However, attention is not a unified function; it is comprised of sub-processes. The ability to switch our focus between tasks or external stimuli is called **divided attention** or **multitasking**. This is separate from our ability to focus on a single task or stimulus, while ignoring distracting information, called **selective attention**. Different from these is **sustained attention**, or the ability to stay on task for long periods of time. Moreover, we also have attention processes that influence our behavior and enable us to inhibit a habitual or dominant response, and others that enable us to distract ourselves when upset or frustrated.

Divided Attention

Young children (age 3-4) have considerable difficulties in dividing their attention between two tasks, and often perform at levels equivalent to our closest relative, the chimpanzee, but by age five they have surpassed the chimp (Hermann, Misch, Hernandez-Lloreda & Tomasello, 2015; Hermann & Tomasello, 2015). Despite these improvements, 5-year-olds continue to perform below the level of school-age children, adolescents, and adults.

Selective Attention

Children's ability with selective attention tasks improve as they age. However, this ability is also greatly influenced by the child's temperament (Rothbart & Rueda, 2005), the complexity of the stimulus or task (Porporino, Shore, Iarocci & Burack, 2004), and along with whether the stimuli are visual or auditory (Guy, Rogers & Cornish, 2013). Guy et al. (2013) found that children's ability to selectively attend to visual information outpaced that of auditory stimuli. This may explain why young children are not able to hear the voice of the teacher over the cacophony of sounds in the typical preschool classroom (Jones, Moore & Amitay, 2015). Jones and his colleagues found that 4 to 7 year-olds could not filter out background noise, especially when its frequencies were close in sound to the target sound. In comparison, 8- to 11-year-old children often performed similar to adults.



Figure 8.7 – A group of children making crafts. [12]

Sustained Attention

Most measures of sustained attention typically ask children to spend several minutes focusing on one task, while waiting for an infrequent event, while there are multiple distractors for several minutes. Berwid, Curko-Kera, Marks & Halperin (2005) asked children between the ages of 3 and 7 to push a button whenever a “target” image was displayed, but they had to refrain from pushing the button when a non-target image was shown. The younger the child, the more difficulty he or she had maintaining their attention.



Figure 8.8 – A child playing a game that measures her sustained attention. [13]

Memory

Based on studies of adults, people with amnesia, and neurological research on memory, researchers have proposed several “types” of memory (see Figure 4.14). **Sensory memory** (also called the sensory register) is the first stage of the memory system, and it stores sensory input in its raw form for a very brief duration; essentially long enough for the brain to register and start processing the information. Studies of auditory sensory memory show that it lasts about one second in 2 year-olds, two seconds in 3-year-olds, more than two seconds in 4-year-olds, and three to five seconds in 6-year-olds (Glass, Sachse, & von Suchodoletz, 2008). Other researchers have also found that young children hold sounds for a shorter duration than do older children and adults, and that this deficit is not due to attentional differences between these age groups, but reflects differences in the performance of the sensory memory system (Gomes et al., 1999). The second stage of the memory system is called short-term or **working memory**. Working memory is the component of memory in which current conscious mental activity occurs.

Working memory often requires conscious effort and adequate use of attention to function effectively. As you read earlier, children in this age group struggle with many aspects of attention and this greatly diminishes their ability to consciously juggle several pieces of information in memory. The capacity of working memory, that is the amount of information someone can hold in consciousness, is smaller in young children than in older children and adults. The typical adult and teenager can hold a 7 digit number active in their short-term memory. The typical 5-year-old can hold only a 4 digit number active. This means that the more complex a mental task is, the less efficient a younger child will be in paying attention to, and actively processing, information in order to complete the task.



Figure 8.8 – A child thinking. [14]

Changes in attention and the working memory system also involve changes in executive function. **Executive function (EF)** refers to self-regulatory processes, such as the ability to inhibit 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.

A child shows higher executive functioning skills when the parents are more warm and responsive, use scaffolding when the child is trying to solve a problem, and provide cognitively stimulating environments for the child (Fay-Stammach, Hawes & Meredith, 2014). For instance, scaffolding was positively correlated with greater cognitive flexibility at age two and inhibitory control at age four (Bibok, Carpendale & Müller, 2009). In Schneider, Kron-Sperl and Hunnerkopf's (2009) longitudinal study of 102 kindergarten children, the majority of children used no strategy to remember information, a finding that was consistent with previous research. As a result, their memory performance was poor when compared to their abilities as they aged and started to use more effective memory strategies.

The third component in memory is **long-term memory**, which is also known as permanent memory. A basic division of long-term memory is between declarative and non-declarative memory.

- **Declarative memories**, sometimes referred to as **explicit memories**, are memories for facts or events that we can consciously recollect. Declarative memory is further divided into semantic and episodic memory.
 - **Semantic memories** are memories for facts and knowledge that are not tied to a timeline,
 - **Episodic memories** are tied to specific events in time.
- **Non- declarative memories**, sometimes referred to as **implicit memories**, are typically automated skills that

do not require conscious recollection.

Autobiographical memory is our personal narrative. Adults rarely remember events from the first few years of life. In other words, we lack autobiographical memories from our experiences as an infant, toddler and very young preschooler. Several factors contribute to the emergence of autobiographical memory including brain maturation, improvements in language, opportunities to talk about experiences with parents and others, the development of theory of mind, and a representation of “self” (Nelson & Fivush, 2004). Two-year-olds do remember fragments of personal experiences, but these are rarely coherent accounts of past events (Nelson & Ross, 1980). Between 2 and 2 1/2 years of age children can provide more information about past experiences. However, these recollections require considerable prodding by adults (Nelson & Fivush, 2004). Over the next few years children will form more detailed autobiographical memories and engage in more reflection of the past.

Neo-Piagetians

As previously discussed, Piaget’s theory has been criticized on many fronts, and updates to reflect more current research have been provided by the **Neo-Piagetians**, or those theorists who provide “new” interpretations of Piaget’s theory. Morra, Gobbo, Marini and Sheese (2008) reviewed Neo-Piagetian theories, which were first presented in the 1970s, and identified how these “new” theories combined Piagetian concepts with those found in Information Processing. Similar to Piaget’s theory, Neo-Piagetian theories believe in constructivism, assume cognitive development can be separated into different stages with qualitatively different characteristics, and advocate that children’s thinking becomes more complex in advanced stages. Unlike Piaget, Neo-Piagetians believe that aspects of information processing change the complexity of each stage, not logic as determined by Piaget.

Neo-Piagetians propose that working memory capacity is affected by biological maturation, and therefore restricts young children's ability to acquire complex thinking and reasoning skills. Increases in working memory performance and cognitive skills development coincide with the timing of several neurodevelopmental processes. These include myelination, axonal and synaptic pruning, changes in cerebral metabolism, and changes in brain activity (Morra et al., 2008).

Myelination especially occurs in waves between birth and adolescence, and the degree of myelination in particular areas explains the increasing efficiency of certain skills. Therefore, brain maturation, which occurs in spurts, affects how and when cognitive skills develop. Additionally, all Neo-Piagetian theories support that experience and learning interact with biological maturation in shaping cognitive development.[\[15\]](#)

CHILDREN'S UNDERSTANDING OF THE WORLD

Both Piaget and Vygotsky believed that children actively try to understand the world around them. More recently developmentalists have added to this understanding by examining how children organize information and develop their own theories about the world.

Theory-Theory

The tendency of children to generate theories to explain everything they encounter is called **theory-theory**. This concept implies that humans are naturally inclined to find reasons and generate explanations for why things occur. Children frequently ask question about what they see or hear around them. When the answers provided do not satisfy their curiosity or are too complicated for them to understand, they generate their own theories. In much the same way that scientists construct and revise their theories, children do the same with their intuitions about the world as they encounter new experiences (Gopnik & Wellman, 2012). One of the

theories they start to generate in early childhood centers on the mental states; both their own and those of others.



Figure 8.9 – What theories might this boy be creating? [16]

Theory of Mind

Theory of mind refers to the ability to think about other people's thoughts. This mental mind reading helps humans to understand and predict the reactions of others, thus playing a crucial role in social development. One common method for determining if a child has reached this mental milestone is the false belief task, described below.

The research began with a clever experiment by Wimmer and Perner (1983), who tested whether children can pass a false-belief test (see Figure 4.17). 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's 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.



Figure 8.10 - A ball. [17]



Figure 8.11 - A basket. [18]



Figure 8.12 - A box. [19]

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). 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 what he or she “knows” to be true from what someone else might “think” is true. In Piagetian terms, they 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 reality. In other words, people can mistakenly believe things that are false and will act based on this false knowledge. Consequently, prior to age four children are rarely successful at solving such a task (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. 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 4.2).

Two-year-olds understand the diversity of desires, yet as noted earlier it is not until age four or five that children grasp false belief, and often not until middle childhood do they understand that people may hide how they really feel. In part, because children in early childhood have difficulty hiding how they really feel.

Cultural Differences in Theory of Mind

Those in early childhood in the US, Australia, and Germany develop theory of mind in the sequence outlined above. Yet, Chinese and Iranian preschoolers acquire knowledge access before diverse beliefs (Shahaeian, Peterson, Slaughter & Wellman, 2011). Shahaeian and colleagues suggested that cultural differences in childrearing 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.



Figure 8.13 – A family from a non-Western culture. [20]

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 empathetic 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.[\[21\]](#)

MILESTONES OF COGNITIVE DEVELOPMENT

The many theories of cognitive development and the different research that has been done about how children understand the world, has allowed researchers to study the milestones that children who are typically developing experience in early childhood. Here is a table that summarizes those.

Table 8.1 – Cognitive Milestones[\[22\]](#)

Typical Age	What Most Children Do by This Age
3 years	Can work toys with buttons, levers, and moving parts
	Plays make-believe with dolls, animals, and people
	Does puzzles with 3 or 4 pieces
	Understands what “two” means
	Names some colors and some numbers
4 years	Understands the idea of counting
	Starts to understand time
	Remembers parts of a story
	Understands the idea of “same” and “different”
	Plays board or card games
5 years	Tells you what he thinks is going to happen next in a book
	Counts 10 or more things
	Knows about things used every day, like money and food

LANGUAGE DEVELOPMENT

Vocabulary Growth

A child's vocabulary expands between the ages of 2 to 6 from about 200 words to over 10,000 words 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, tend to learn nouns more readily. But, those learning less verb-friendly languages such as English, seem to need assistance in grammar to master the use of verbs (Imai, et al, 2008).



Figure 8.14 – A woman instructing a girl on vocabulary. [23]

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, two preschool-aged girls began to laugh loudly while listening to a tape-recording of Disney's "Sleeping Beauty" when the narrator reports, "Prince Phillip lost his head!" They imagine his head popping off and rolling down the hill as he runs and searches for it. Or a classroom full of preschoolers hears the teacher say, "Wow! That was a piece of cake!" The children began asking "Cake? Where is my cake? I want cake!"

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 form a sentence such as “I goed there. I doed that.” This is typical at ages 2 and 3. They will soon 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 goed there!” and the adult responds, “You went there? Say, ‘I went there.’ Where did you go?” 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 adult (or more skilled peer) provides needed assistance to the child as a new skill is learned.

Language Milestones

The prior aspects of language development in early childhood can also be summarized into the progression of milestones children typically experience from ages 3 to 5. Here is a table of those.

Table 8.2 – Language Milestones[24]

Typical Age	What Most Children Do By This Age
3 years	Follows instructions with 2 or 3 steps Can name most familiar things
	Understands words like “in,” “on,” and “under”
	Says first name, age, and sex
	Names a friend
4 years	Says words like “I,” “me,” “we,” and “you” and some plurals (cars, dogs, cats)
	Talks well enough for strangers to understand most of the time
	Carries on a conversation using 2 to 3 sentences
	Knows some basic rules of grammar, such as correctly using “he” and “she” Sings a song or says a poem from memory such as the “Itsy Bitsy Spider” or the “Wheels on the Bus”
5 years	Tells stories
	Can say first and last name
	Speaks very clearly Tells a simple story using full sentences
	Uses future tense; for example, “Grandma will be here.” Says name and address

Now that we have addressed some of the cognitive areas of growth in early childhood, let’s take a look at the topic of school and its various applications.

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 early childhood education 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 relationships among all children and adults are promoted.
- A curriculum that supports learning and development in social, emotional, physical, language, and cognitive areas.
- Teaching approaches that are developmentally, culturally and linguistically appropriate.
- Assessment of children's progress to provide information on learning and development.
- The health and nutrition of children 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.

- The 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 the NAEYC criteria as a guide and template for asking questions that will assist them in choosing the best program for their child.



Figure 8.15 – Children making crafts at preschool. [25]

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, Creative Curriculum and Bank Street as types of early childhood education programs that focus on children learning through discovery. Teachers act as facilitators of children's learning and development and create activities based on the child's developmental level. Here is a table summarizes characteristics of each type of program.

Table 8.3 – Types of Early Childhood Education Programs[\[26\]](#)

Program	Founder	Characteristics
Montessori	Dr. Maria Montessori	Refers to children's activity as work (not play); children are given long periods of time to work Focus on individual learning
		Features child-sized furniture and defined work areas
		Materials are carefully chosen and introduced to children by teacher
		Features mixed-aged grouping
		Teachers should be certified
Waldorf	Rudolf Steiner	Focus on whole child Features connections to nature, sensory learning, and imagination
		Provides large blocks of time for play
		Delay formal academic instruction
		Environment protects children from negative influences
		Relationships are important so groupings last for several years (looping)
Reggio Emilia	Loris Malaguzzi	Teachers should be certified
		Teachers and children co-construct the curriculum
		Teachers are researchers
		Environment is the third teacher and features beauty and order
		Children's learning is documented through the multiple methods (100 languages of children)
		Have atelier (art studio) with an atelierista (artist) to instruct children
		Believe children are competent and capable
		Children stay together for 3 years
		Parents partner with teachers
		Community is extension of school

Program	Founder	Characteristics
High Scope	David Weikart	Features defined learning areas Has 8 content areas with 58 key developmental indicators
		Consistency of daily routine is important
		Uses plan-do-review sequence in which they make a plan, act on it, and then reflect on the results
		Teachers are partners and use the Child Observation Record (COR) to help assess children and plan curriculum
Bank Street	Lucy Sprague Mitchell	Utilizes 6 step process to teach children conflict resolution
		Also referred to as the Developmental-Interactionist Approach
		Environment is arranged into learning centers
		Focus on hands-on experience with long periods of time given
		Teacher uses questions to further children's exploration
		Blocks are primary material in the classroom
Creative Curriculum	Diane Trister Dodge	Field trips are frequently used
		Focus on children's play and self-selected activities
		Environment is arranged into learning areas
		Large blocks of time are given for self-selected play
		Uses projects as basis for curriculum
		Is researched based and includes assessment system

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.



Figure 8.16 – A photograph from when Head Start began. [27]

A recent report dated July 2015 evaluating the effectiveness of Head Start comes from the What Works Clearinghouse. The What Works Clearinghouse identifies research that provides reliable evidence of the effectiveness of programs and practices in education, and is managed by the Institute of Education Services for the United States Department of Education. After reviewing 90 studies on the effectiveness of Head Start, only one study was deemed scientifically acceptable and this study showed disappointing results (Barshay, 2015). This 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. 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).[\[28\]](#)

APPLICATIONS TO EARLY EDUCATION

Understanding how children think and learn has proven useful for improving education. Activities like playing games that involve working with numbers and spatial relationships can give young children a developmental advantage over peers who have less exposure to the same concepts.

Mathematics

Even before they enter kindergarten, the mathematical knowledge of children from low-income backgrounds lags far behind that of children from more affluent backgrounds. Ramani and Siegler (2008) hypothesized that this difference is due to the children in middle- and upper-income families engaging more frequently in numerical activities, for example playing numerical board games such as Chutes and Ladders. Chutes and Ladders is a game with a number in each square; children start at the number one and spin a spinner or throw a dice to determine how far to move their token. Playing this game seemed likely to teach children about numbers, because in it, larger numbers are associated with greater values on a variety of dimensions. In particular, the higher the number that a child's token reaches, the greater the distance the token will have traveled from the starting point, the greater the number of physical movements the child will have made in moving the token from one square to another, the greater the number of number-words the child will have said and heard, and the

more time will have passed since the beginning of the game. These spatial, kinesthetic, verbal, and time-based cues provide a broad-based, multisensory foundation for knowledge of numerical magnitudes (the sizes of numbers), a type of knowledge that is closely related to mathematics achievement test scores (Booth & Siegler, 2006).

Playing this numerical board game for roughly 1 hour, distributed over a 2-week period, improved low-income children's knowledge of numerical magnitudes, ability to read printed numbers, and skill at learning novel arithmetic problems. The gains lasted for months after the game-playing experience (Ramani & Siegler, 2008; Siegler & Ramani, 2009). An advantage of this type of educational intervention is that it has minimal if any cost—a parent could just draw a game on a piece of paper.

Reading

Cognitive developmental research has shown that phonemic awareness—that is, awareness of the component sounds within words—is a crucial skill in learning to read. To measure awareness of the component sounds within words, researchers ask children to decide whether two words rhyme, to decide whether the words start with the same sound, to identify the component sounds within words, and to indicate what would be left if a given sound were removed from a word. Kindergartners' performance on these tasks is the strongest predictor of reading achievement in third and fourth grade, even stronger than IQ or social class background (Nation, 2008). Moreover, teaching these skills to randomly chosen 4- and 5-year-olds results in their being better readers years later (National Reading Panel, 2000).

Continuing Brain Maturation

Understanding of cognitive development is advancing on many different fronts. One exciting area is linking changes in brain activity to changes in children's thinking (Nelson et al., 2006). Although many people believe that brain maturation is something that occurs before birth, the brain actually continues to change in large ways for many years thereafter. For example, a part of the brain called the prefrontal cortex, which is located at the front of the brain and is particularly involved with planning and flexible problem solving, continues to develop throughout adolescence (Blakemore & Choudhury, 2006). Such new research domains, as well as enduring issues such as nature and nurture, continuity and discontinuity, and how to apply cognitive development research to education, insure that cognitive development will continue to be an exciting area of research in the coming years.[\[29\]](#)

COGNITIVE DIFFERENCES

Sometimes children's brains work differently. One form of this neurodiversity is **Autism spectrum disorder**.

Autism: Defining Spectrum Disorder

Autism spectrum disorder (ASD) describes a range of conditions classified as neuro-developmental disorders in the fifth revision of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The DSM-5, published in 2013, redefined the autism spectrum to encompass the previous (DSM-IV-TR) diagnoses of autism, Asperger syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS), and childhood disintegrative disorder. These disorders are characterized by social deficits and communication difficulties, repetitive behaviors and interests, sensory issues, and in some cases, cognitive delays.

Asperger syndrome was distinguished from autism in the earlier DSM-IV by the lack of delay or deviance in early language development. Additionally, individuals diagnosed with Asperger syndrome did not have significant cognitive delays. PDD-NOS was considered “subthreshold autism” and “atypical autism” because it was often characterized by milder symptoms of autism or symptoms in only one domain (such as social difficulties). In the DSM-5, both of these diagnoses have been subsumed into autism spectrum disorder.

Autism spectrum disorders are considered to be on a spectrum because each individual with ASD expresses the disorder uniquely and has varying degrees of functionality. Many have above-average intellectual abilities and excel in visual skills, music, math, and the arts, while others have significant disabilities and are unable to live independently. About 25 percent of individuals with ASD are nonverbal; however, they may learn to communicate using other means.

Social Communication Symptoms

Social impairments in children with autism can be characterized by a distinctive lack of intuition about others. Unusual social development becomes apparent early in childhood. Infants with ASD show less attention to social stimuli, smile and look at others less often, and respond less to their own name. Toddlers with ASD differ more strikingly from social norms; for example, they may show less eye contact and turn-taking and may not have the ability to use simple movements to express themselves. Individuals with severe forms of ASD do not develop enough natural speech to meet their daily communication needs.

Restricted and Repetitive Behaviors

Children with ASD may exhibit repetitive or restricted behavior, including:

- Stereotypy—repetitive movement, such as hand flapping, head rolling, or body rocking.
- Compulsive behavior—exhibiting intention to follow rules, such as arranging objects in stacks or lines.
- Sameness—resistance to change; for example, insisting that the furniture not be moved or sticking to an unvarying pattern of daily activities.
- Restricted behavior—limits in focus, interest, or activity, such as preoccupation with a single television program, toy, or game.
- Self-injury—movements that injure or can injure the person, such as eye poking, skin picking, hand biting, and head banging.



Figure 8.17 – A boy stacking cans. [30]

Etiology

While specific causes of ASD have yet to be found, many risk factors have been identified in the research literature that may contribute to its development. These risk factors include genetics, prenatal and perinatal factors, neuroanatomical abnormalities, and environmental factors. It is possible to identify general risk factors, but much more difficult to pinpoint specific factors.

Genetics

ASD affects information processing in the brain by altering how nerve cells and their synapses connect and organize; thus, it is categorized as a neuro-developmental disorder. The results of family and twin studies suggest that genetic factors play a role in the etiology of ASD and other pervasive developmental disorders. Studies have consistently found that the prevalence of ASD in siblings of children with ASD is approximately 15 to 30 times greater than the rate in the general population. In addition, research suggests that there is a much higher concordance rate among monozygotic (identical) twins compared to dizygotic (fraternal) twins. It appears that there is no single gene that can account for ASD; instead, there seem to be multiple genes involved, each of which is a risk factor for part of the autism syndrome through various groups. It is unclear whether ASD is explained more by rare mutations or by combinations of common genetic variants.

The Diversity of the Autism Spectrum

The rainbow-colored infinity symbol represents the diversity of the autism spectrum as well as the greater neurodiversity movement. The neurodiversity movement suggests that diverse neurological conditions appear as a result of normal variations in the human genome. It challenges the idea that such neurological differences are inherently pathological, instead asserting that differences should be recognized and respected

as a social category on a par with gender, ethnicity, sexual orientation, or disability status.



Figure 8.18 – A symbol of the autism spectrum. [31]

Prenatal and Perinatal Factors

A number of prenatal and perinatal complications have been reported as possible risk factors for ASD. These risk factors include maternal gestational diabetes, maternal and paternal age over 30, bleeding after first trimester, use of prescription medication (such as valproate) during pregnancy, and meconium (the earliest stool of an infant) in the amniotic fluid. While research is not conclusive on the relation of these factors to ASD, each of these factors has been identified more frequently in children with ASD than in developing youth without ASD.

Environmental Factors

Evidence for environmental causes is anecdotal and has not been confirmed by reliable studies. In the last few decades, controversy surrounded the idea that vaccinations may be the cause for many cases of autism; however, these theories lack scientific evidence and are biologically implausible. Even still, parental concern about a potential vaccine link with autism has led to lower rates of childhood immunizations, outbreaks

of previously controlled childhood diseases in some countries, and the preventable deaths of several children.

Treatment

There is no known cure for ASD, and treatment tends to focus on management of symptoms. The main goals when treating children with ASD are to lessen associated deficits and family distress and to increase quality of life and functional independence.[\[32\]](#) Treatment for ASD should begin as soon as possible after diagnosis. Early treatment for ASD is important as proper care can reduce individuals' difficulties while helping them learn new skills and make the most of their strengths.

The wide range of issues facing people with ASD means that there is no single best treatment for ASD.[\[33\]](#) So treatment is typically tailored to the individual person's needs. Intensive, sustained special-education programs and behavior therapy yearly in life can help children acquire self-care, social, and job skills. The most widely used therapy is **applied behavior analysis** (ABA); other available approaches include developmental models, structured teaching, speech and language therapy, social skills therapy, and occupational therapy.[\[34\]](#)



Figure 8.19 – A boy with ASD receiving therapy. [35]

There has been increasing attention to the development of evidenced-based interventions for young children with ASD. Although evidence-based interventions for children with ASD vary in their methods, many adopt a psychoeducational approach to enhancing cognitive, communication, and social skills while minimizing behaviors that are thought to be problematic.[\[36\]](#)

Conclusion

In this chapter we covered,

- Piaget's preoperational stage.
- Vygotsky's sociocultural theory.
- Information processing.
- How young children understand the world.
- Typical progression of cognitive and language development (milestones).

- Early childhood education.
- Autism spectrum disorder.

In the next chapter, we will finish covering early childhood education by looking at how children understand themselves and interact with the world.

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CHAPTER 9: SOCIAL EMOTIONAL DEVELOPMENT IN EARLY CHILDHOOD

Chapter Objectives

After reading this chapter, you should be able to:

1. Describe how preschoolers view themselves.
2. Summarize Erikson's stage of initiative versus guilt.
3. Discuss the progression of social emotional development during early childhood.
4. Explain how children develop their understanding of gender.
5. Compare and contrast different styles of parenting.
6. Define characteristics of high quality child care.
7. Discuss the role of siblings and peers.
8. Describe the types of play.
9. Summarize the influence on social and emotional competence.
10. Identify the effects of stress on three- to five-year olds.

INTRODUCTION

In early childhood, children's understanding of themselves and their role in the world expands greatly.

SOCIAL AND EMOTIONAL MILESTONES

That expanding understanding of themselves and others develops with age. Here is a table of social and emotional milestones that children typically experience during early childhood.

Table 9.1 – Social and Emotional Milestones^[1]

Typical Age	What Most Children Do by This Age
3 years	Copies adults and friends
	Shows affection for friends without prompting
	Takes turns in games
	Shows concern for a crying friend
	Dresses and undresses self
	Understands the idea of “mine” and “his” or “hers”
	Shows a wide range of emotions
	Separates easily from mom and dad
	May get upset with major changes in routine
	Enjoys doing new things
4 years	Is more and more creative with make-believe play
	Would rather play with other children than by self
	Cooperates with other children
	Plays “mom” or “dad”
	Often can’t tell what’s real and what’s make-believe
	Talks about what she likes and what she is interested in
	Wants to please friends
5 years	Wants to be like friends
	More likely to agree with rules
	Likes to sing, dance, and act
	Is aware of gender
	Can tell what’s real and what’s make-believe
	Shows more independence
	Is sometimes demanding and sometimes very cooperative

Many things influence how children develop those milestones as how they view themselves and how they interact with those around them changes. Let's look more at these.

INTERACTIONISM AND VIEWS OF SELF

Early childhood is a time of forming an initial sense of self. A **self-concept** or idea of who we are, what we are capable of doing, and how we think and feel is a social process that involves taking into consideration how others view us. So, in order to develop a sense of self, you must have interaction with others. Interactionist theorists, Cooley and Mead offer two interesting explanations of how a sense of self develops.

Cooley

Charles Horton Cooley (1964) suggests that our self-concept comes from looking at how others respond to us. This process, known as the **looking-glass self** involves looking at how others seem to view us and interpreting this as we make judgments about whether we are good or bad, strong or weak, beautiful or ugly, and so on. Of course, we do not always interpret their responses accurately so our self-concept is not simply a mirror reflection of the views of others. After forming an initial self-concept, we may use it as a mental filter screening out those responses that do not seem to fit our ideas of who we are. Some compliments may be negated, for example. The process of the looking-glass self is pronounced when we are preschoolers, or perhaps when we are in a new school or job or are taking on a new role in our personal lives and are trying to gauge our own performances. When we feel more sure of who we are, we focus less on how we appear to others.[\[2\]](#)



Figure 9.1 – A child looking at herself wearing glasses in a mirror. [3]

Mead

Herbert Mead (1967) offers an explanation of how we develop a social sense of self by being able to see ourselves through the eyes of others. There are two parts of the self: the “I” which is the part of the self that is spontaneous, creative, innate, and is not concerned with how others view us and the “me” or the social definition of who we are.

When we are born, we are all “I” and act without concern about how others view us. But the socialized self begins when we are able to consider how one important person views us. This initial stage is called “taking the role of the significant other”. For example, a child may pull a cat’s tail and be told by his mother, “No! Don’t do that, that’s bad” while receiving a slight slap on the hand. Later, the child may mimic the same behavior toward the self and say aloud, “No, that’s bad” while patting his own hand. What has happened? The child is able to see himself through the eyes of the mother. As the child grows and is exposed to many situations and rules of culture, he begins to view the self in the eyes of many others through these cultural norms or rules. This is referred to as “taking the role of the generalized other” and results in a sense of self with many

dimensions. The child comes to have a sense of self as student, as friend, as son, and so on.

Exaggerated Sense of Self

One of the ways to gain a clearer sense of self is to exaggerate those qualities that are to be incorporated into the self. Preschoolers often like to exaggerate their own qualities or to seek validation as the biggest, smartest, or child who can jump the highest. This exaggeration tends to be replaced by a more realistic sense of self in middle childhood.

Self-Esteem

Early childhood is a time of forming an initial sense of self. **Self-concept** is our self-description according to various categories, such as our external and internal qualities. In contrast, **self-esteem** is an evaluative judgment about who we are. The emergence of cognitive skills in this age group results in improved perceptions of the self, but they tend to focus on external qualities, which are referred to as the **categorical self**. When researchers ask young children to describe themselves, their descriptions tend to include physical descriptors, preferred activities, and favorite possessions. Thus, the **self-description** of a 3-year-old might be a 3-year-old girl with red hair, who likes to play with blocks. However, even children as young as three know there is more to themselves than these external characteristics.

Harter and Pike (1984) challenged the method of measuring personality with an open-ended question as they felt that language limitations were hindering the ability of young children to express their self-knowledge. They suggested a change to the method of measuring self-concept in young children, whereby researchers provide statements that ask whether something is true of the child (e.g., “I like to boss people around”, “I am grumpy most of the time”). They discovered that in early childhood, children answer these

statements in an internally consistent manner, especially after the age of four (Goodvin, Meyer, Thompson & Hayes, 2008) and often give similar responses to what others (parents and teachers) say about the child (Brown, Mangelsdorf, Agathen, & Ho, 2008; Colwell & Lindsey, 2003).



Figure 9.2 – Young children don't always feel good about themselves.
[4]

Young children tend to have a generally positive self-image. This optimism is often the result of a lack of social comparison when making self-evaluations (Ruble, Boggiano, Feldman, & Loeb, 1980), and with comparison between what the child once could do to what they can do now (Kemple, 1995). However, this does not mean that preschool children are exempt from negative self-evaluations. Preschool children with insecure attachments to their caregivers tend to have lower self-esteem at age four (Goodvin et al., 2008). Maternal negative affect (emotional state) was also found by Goodwin and her colleagues to produce more negative self-evaluations in preschool children.

Self-Control

Self-control is not a single phenomenon, but is multi-faceted. It includes **response initiation**, the ability to not initiate a behavior before you have evaluated all of the information,

response inhibition, the ability to stop a behavior that has already begun, and **delayed gratification**, the ability to hold out for a larger reward by forgoing a smaller immediate reward (Dougherty, Marsh, Mathias, & Swann, 2005). It is in early childhood that we see the start of self-control, a process that takes many years to fully develop. In the now classic “Marshmallow Test” (Mischel, Ebbesen, & Zeiss, 1972) children are confronted with the choice of a small immediate reward (a marshmallow) and a larger delayed reward (more 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). Self-control is related to executive function, discussed earlier in the chapter. As executive function improves, children become less impulsive (Traverso, Viterbori, & Usai, 2015).[\[5\]](#)

Self-Control and Play

Thanks to the new Centre for Research on Play in Education, Development and Learning (PEDaL), Whitebread, Baker, Gibson and a team of researchers hope to provide 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. “These are our abilities to develop awareness of our own thinking processes – they influence how effectively we go about undertaking challenging activities.”

In a study carried out by Baker with toddlers and young preschoolers, she found that children with greater self-control solved problems quicker when exploring an unfamiliar set-up requiring scientific reasoning, regardless of their IQ. “This sort of evidence makes us think that giving children the chance to

play will make them more successful and creative problem-solvers in the long run.”

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 behavior 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.”[\[6\]](#)

ERIKSON: INITIATIVE VS. GUILT

Psychologist Erik Erikson argues that children in early childhood go through a stage of “initiative vs. guilt”. If the child is placed in an environment where he/she can explore, make decisions, and initiate activities, they have achieved initiative. On the other hand, if the child is put in an environment where initiation is repressed through criticism and control, he/she will develop a sense of guilt.



Figure 9.3 – Children playing in the sand. [7]

The trust and autonomy of previous stages develop into a desire to take initiative or to think of ideas and initiative action. 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. To reinforce taking initiative, caregivers should offer praise for the child's efforts and avoid being critical of messes or mistakes. Soggy washrags and toothpaste left in the sink pales in comparison to the smiling face of a five-year-old that emerges from the bathroom with clean teeth and pajamas![\[8\]](#)

Gender Identity, Gender Constancy, and Gender Roles

Another important dimension of the self is the sense of self as male or female. Preschool-aged children become increasingly interested in finding out the differences between boys and girls both physically and in terms of what activities are acceptable for each. While 2 year olds can identify some differences and learn whether they are boys or girls, preschoolers become more interested in what it means to be male or female. This self-identification or **gender identity** is followed sometime later with **gender constancy** or the knowledge that gender does not change. **Gender roles** or the rights and expectations that are associated with being male or female are learned throughout childhood and into adulthood.

Freud and the Phallic Stage

Freud believed that masculinity and femininity were learned during the phallic stage of psychosexual development. According to Freud, during the phallic stage, the child develops an attraction to the opposite-sex parent but after recognizing that that they cannot actually be romantically involved with that parent, the child learns to model their own behavior after the same-sex parent. The child develops his or her own sense of masculinity or femininity from this

resolution. And, according to Freud, a person who does not exhibit gender appropriate behavior, such as a woman who competes with men for jobs or a man who lacks self-assurance and dominance, has not successfully completed this stage of development. Consequently, such a person continues to struggle with his or her own gender identity.

Chodorow and Mothering

Chodorow, a Neo-Freudian, believed that mothering promotes gender stereotypic behavior. Mothers push their sons away too soon and direct their attention toward problem-solving and independence. As a result, sons grow up confident in their own abilities but uncomfortable with intimacy. Girls are kept dependent too long and are given unnecessary and even unwelcome assistance from their mothers. Girls learn to underestimate their abilities and lack assertiveness, but feel comfortable with intimacy.



Figure 9.4 - A boy showing independence and confidence. [9]



Figure 9.5 – A girl showing dependence and comfort within a relationship. [10]

Both of these models assume that early childhood experiences result in lifelong gender self-concepts. However, gender socialization is a process that continues throughout life. Children, teens, and adults refine and can modify their sense of self based on gender.

Learning through Reinforcement and Modeling

Learning theorists suggest that gender role socialization is a result of the ways in which parents, teachers, friends, schools, religious institutions, media and others send messages about what is acceptable or desirable behavior as males or females. This socialization begins early-in fact, it may even begin the moment a parent learns that a child is on the way. Knowing the sex of the child can conjure up images of the child's behavior, appearance, and potential on the part of a parent. And this stereotyping continues to guide perception through life. Consider parents of newborns, shown a 7 pound, 20 inch baby, wrapped in blue (a color designating males) describe the child as tough, strong, and angry when crying. Shown the same infant in pink (a color used in the United States for baby girls), these parents are likely to describe the baby as pretty, delicate, and frustrated when

crying. (Maccoby & Jacklin, 1987). Female infants are held more, talked to more frequently and given direct eye contact, while male infants play is often mediated through a toy or activity.

Sons are given tasks that take them outside the house and that have to be performed only on occasion while girls are more likely to be given chores inside the home such as cleaning or cooking that is performed daily. Sons are encouraged to think for themselves when they encounter problems and daughters are more likely to be given assistance even when they are working on an answer. This impatience is reflected in teachers waiting less time when asking a female student for an answer than when asking for a reply from a male student (Sadker and Sadker, 1994). Girls are given the message from teachers that they must try harder and endure in order to succeed while boys' successes are attributed to their intelligence. Of course, the stereotypes of advisors can also influence which kinds of courses or vocational choices girls and boys are encouraged to make.

Friends discuss what is acceptable for boys and girls and popularity may be based on modeling what is considered ideal behavior or looks for the sexes. Girls tend to tell one another secrets to validate others as best friends while boys compete for position by emphasizing their knowledge, strength or accomplishments. This focus on accomplishments can even give rise to exaggerating accomplishments in boys, but girls are discouraged from showing off and may learn to minimize their accomplishments as a result.

Gender messages abound in our environment. But does this mean that each of us receives and interprets these messages in the same way? Probably not. In addition to being recipients of these cultural expectations, we are individuals who also modify these roles (Kimmel, 2008). Based on what young children learn about gender from parents, peers, and those who they observe

in society, children develop their own conceptions of the attributes associated with maleness or femaleness which is referred to as **gender schemas**.

How much does gender matter? In the United States, gender differences are found in school experiences (even into college and professional school, girls are less vocal in the classrooms and much more at risk for sexual harassment from teachers, coaches, classmates, and professors), in social interactions and in media messages. The **stereotypes** that boys should be strong, forceful, active, dominant, and rational and that girls should be pretty, subordinate, unintelligent, emotional, and gabby are portrayed in children's toys, books, commercials, video games, movies, television shows and music.



Figure 9.6 – Store shelves filled with pink and purple colors and girls' toys. [11]



Figure 9.7 – Store shelves filled with primary colors and boys' toys.
[12]

In adulthood, these differences are reflected in income gaps between men and women where women working full-time earn about 74 percent the income of men, in higher rates of women suffering rape and domestic violence, higher rates of eating disorders for females, and in higher rates of violent death for men in young adulthood. Each of these differences will be explored further in subsequent chapters. [\[13\]](#)

Gender Dysphoria

A growing body of research is now focused on Gender Dysphoria, or the distress accompanying a mismatch between one's gender identity and biological sex (American Psychiatric Association, 2013). Although prevalence rates are low, at approximately 0.3 percent of the United States population (Russo, 2016), children who later identified as transgender, often stated that they were the opposite gender as soon as they began talking. Comments such as stating they prefer the toys, clothing and anatomy of the opposite sex, while rejecting the toys, clothing, and anatomy of their assigned sex are criteria for a diagnosis of Gender Dysphoria in children. Certainly, many young children do not conform to the gender roles modeled

by the culture and even push back against assigned roles. However, they do not experience discomfort regarding their gender identity and would not be identified with Gender Dysphoria. A more comprehensive description of Gender Dysphoria, including current treatments, will be discussed in the chapter on adolescence.[\[14\]](#)

FAMILY LIFE

Relationships between parents and children continue to play a significant role in children's development during early childhood. We will explore two models of parenting styles. Keep in mind that most parents do not follow any model completely. Real people tend to fall somewhere in between these styles. And sometimes parenting styles change from one child to the next or in times when the parent has more or less time and energy for parenting. Parenting styles can also be affected by concerns the parent has in other areas of 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. And of course, parenting styles may reflect the type of parenting someone saw modeled while growing up.



Figure 9.8 – A family playing outside together. [15]

Baumrind

Baumrind (1971) offers a model of parenting that includes four styles. The first, **authoritarian**, is the traditional model of parenting in which parents make the rules and children are expected to be obedient. Baumrind suggests that authoritarian parents tend to place maturity demands on their children that are unreasonably high and tend to be aloof and distant. Consequently, children reared in this way may fear rather than respect their parents and, because their parents do not allow discussion, may take out their frustrations on safer targets-perhaps as bullies toward peers.

Permissive parenting involves 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.

Authoritative parenting involves being appropriately strict, reasonable, and affectionate. Parents allow negotiation where appropriate and discipline matches the severity of the

offense. A popular parenting program that is offered in many school districts is called “Love and Logic” and reflects the authoritative or democratic style of parenting just described.

Uninvolved parents (also referred to as rejecting/neglecting) 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).

Lemasters and Defrain

Lemasters and Defrain (1989) offer another model of parenting. This model is interesting because it looks more closely at the motivations of the parent and suggests that parenting styles are often designed to meet the psychological needs of the parent rather than the developmental needs of the child.

The **martyr** is a parent who will do anything for the child; even tasks that the child should do for himself or herself. All of the good deeds performed for the child, in the name of being a “good parent”, may be used later should the parent want to gain compliance from the child. If a child goes against the parent’s wishes, the parent can remind the child of all of the times the parent helped the child and evoke a feeling of guilt so that the child will do what the parent wants. The child learns to be dependent and manipulative as a result.

The **pal** is like the permissive parent described previously in Baumrind’s model. The pal wants to be the child’s friend. Perhaps the parent is lonely or perhaps the parent is trying to win a popularity contest against an ex-spouse. Pals let children do what they want and focus mostly on being entertaining and fun and set few limitations. Consequently, the child may have little self-discipline and may try to test limits with others.

The **police officer/drill sergeant** style of parenting is similar to the authoritarian parent described by Baumrind. The parent focuses primarily on making sure that the child is obedient and that the parent has full control of the child. Sometimes this can be taken to extreme by giving the child tasks that are really designed to check on their level of obedience. For example, the parent may require that the child fold the clothes and place items back in the drawer in a particular way. If not, the child might be scolded or punished for not doing things “right”. This type of parent has a very difficult time allowing the child to grow and learn to make decisions independently. And the child may have a lot of resentment toward the parent that is displaced on others.

The **teacher-counselor** parent is one who pays a lot of attention to expert advice on parenting and who believes that as long as all of the steps are followed, the parent can rear a perfect child. “What’s wrong with that?” you might ask. There are two major problems with this approach. First, the parent is taking all of the responsibility for the child’s behavior—at least indirectly. If the child has difficulty, the parent feels responsible and thinks that the solution lies in reading more advice and trying more diligently to follow that advice.

Parents can certainly influence children, but thinking that the parent is fully responsible for the child’s outcome is misguided. A parent can only do so much and can never have full control over the child. Another problem with this approach is that the child may get an unrealistic sense of the world and what can be expected from others. For example, if a teacher-counselor parent decides to help the child build self-esteem and has read that telling the child how special he or she is or how important it is to compliment the child on a job well done, the parent may convey the message that everything the child does is exceptional or extraordinary. A child may come to expect that all of his efforts warrant praise and in the real world, this is not something one can expect. Perhaps children get more of a

sense of pride from assessing their own performance than from having others praise their efforts.



Figure 9.9 – A father interacting with his son who is drawing a picture. He could be portraying the style of teacher-counselor or athletic coach. [16]

So what is left? Lemasters and Defrain (1989) suggest that the **athletic coach** style of parenting is best. Before you draw conclusions here, set aside any negative experiences you may have had with coaches in the past. The principles of coaching are what are important to Lemasters and Defrain. A coach helps players form strategies, supports their efforts, gives feedback on what went right and what went wrong, and stands at the sideline while the players perform. Coaches and referees make sure that the rules of the game are followed and that all players adhere to those rules. Similarly, the athletic coach as parent helps the child understand what needs to happen in certain situations whether in friendships, school, or home life, and encourages and advises the child about how to manage these situations. The parent does not intervene or do things for the child. Their role is to provide guidance while the child learns firsthand how to handle these situations. And the rules for behavior are consistent and objective and presented in that way. So, a child who is late for dinner might hear the parent respond in this way, “Dinner was at six o’clock.” Rather than,

“You know good and well that we always eat at six. If you expect me to get up and make something for you now, you have got another thing coming! Just who do you think you are showing up late and looking for food? You’re grounded until further notice!” The most important thing to remember about parenting is that you can be a better, more objective parent when you are directing your actions toward the child’s needs and while considering what they can reasonably be expected to do at their stage of development. Parenting is more difficult when you are tired and have psychological needs that interfere with the relationship. Some of the best advice for parents is to try not to take the child’s actions personally and be as objective as possible.

Cultural Influences on Parenting Styles

The impact of class and culture cannot be ignored when examining parenting styles. The two models of parenting described above assume that authoritative and athletic coaching styles are best because they are designed to help the parent raise a child who is independent, self-reliant and responsible. These are qualities favored in “individualistic” cultures such as the United States, particularly by the white middle class. African-American, Hispanic and Asian parents tend to be more authoritarian than non-Hispanic whites.



Figure 9.10 – A family from a collectivistic culture. [17]

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. In societies where family members’ cooperation is necessary for survival, as in the case of raising crops, rearing children who are independent and who strive to be on their own makes no sense. But in an economy based on being mobile in order to find jobs and where one’s earnings are based on education, raising a child to be independent is very important. Working class parents are more likely than middle class parents to focus on obedience and honesty when raising their children. In a classic study on social class and parenting styles called *Class and Conformity*, Kohn (1977) 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. [18]

Spanking

Many adults can remember being spanked as a child. This method of discipline continues to be endorsed by the majority of parents (Smith, 2012). Just how effective is spanking, however, and are there any 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).



Figure 9.11 – A boy crying. [19]

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. Gershoff and Grogan-Kaylor (2016) completed another metanalysis that looked at research over 160,927 children . They found increased risk for negative outcomes for children who are spanked and that effects of spanking were similar to that of physical abuse. 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 (aggression and rule-breaking) and receptive vocabulary were assessed at age nine. Overall, 57% of mothers and 40% of fathers engaged in spanking when children were age 3, and 52% of mothers and 33% of fathers engaged in spanking at age 5. Maternal spanking at age 5, even at low levels, was associated with higher levels of aggression at age 9, even after an array of risks and earlier child behavior were controlled for. Father's high-frequency spanking at age 5 was associated with lower child receptive vocabulary scores at age 9. This study revealed the negative cognitive effects of spanking in addition to the increase in aggressive behavior. Internationally, physical discipline is increasingly being viewed as a violation of children's human rights. Thirty 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. 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

Changing Families in a Changing Society

The sociology of the family examines the family as an institution and a unit of socialization. Sociological studies of the family look at demographic characteristics of the family members: family size, age, ethnicity and gender of its members, social class of the family, the economic level and mobility of the family, professions of its members, and the education levels of the family members.

Currently, one of the biggest issues that sociologists study are the changing roles of family members. Often, each member is restricted by the gender roles of the traditional family. These roles, such as the father as the breadwinner and the mother as the homemaker, are declining. Now, the mother is often the supplementary provider while retaining the responsibilities of child rearing. In this scenario, females' role in the labor force is "compatible with the demands of the traditional family." Sociology studies the adaptation of males' role to caregiver as well as provider. The gender roles are increasingly interwoven.

Diverse Family Forms

A **single parent family** usually refers to a parent who has most of the day-to-day responsibilities in the raising of the child or children, who is not living with a spouse or partner, or who is not married. The dominant caregiver is the parent with whom the children reside the majority of the time. If the parents are separated or divorced, children live with their custodial parent and have visitation with their noncustodial parent. In western society in general, following separation a child will end up with the primary caregiver, usually the mother, and a secondary

caregiver, usually the father. There is a growing community of **single parent by choice** families in which a family is built by a single adult (through foster care, adoption, donor gametes and embryos, and surrogacy).



Figure 9.12 – A single-parent family. [20]

Cohabitation is an arrangement where two people who are not married live together in an intimate relationship, particularly an emotionally and/or sexually intimate one, on a long-term or permanent basis. Today, cohabitation is a common pattern among people in the Western world. More than two-thirds of married couples in the U.S. say that they lived together before getting married. Gay and lesbian couples are categorized as **same-sex relationships**. [21] After a Supreme Court ruling in 2015, all 50 states in the U.S. must recognize same-sex marriage, there are still some counties in several states that will not issue a marriage license to a same-sex couple. [22]



Figure 9.13 – A family with parents of the same sex. [23]

Sibling Relationships

Siblings spend a considerable amount of time with each other and offer a unique relationship that is not found with same-age peers or with adults. Siblings play an important role in the development of social skills. Cooperative and pretend play interactions between younger and older siblings can teach empathy, sharing, and cooperation (Pike, Coldwell, & Dunn, 2005) as well as negotiation and conflict resolution (Abuhatoum & Howe, 2013). However, the quality of sibling relationships is often mediated by the quality of the parent-child relationship and the psychological adjustment of the child (Pike et al., 2005). For instance, more negative interactions between siblings have been reported in families where parents had poor patterns of communication with their children (Brody, Stoneman, & McCoy, 1994). Children who have emotional and behavioral problems are also more likely to have negative interactions with their siblings. However, the psychological adjustment of the child can sometimes be a reflection of the parent-child relationship. Thus, when examining the quality of sibling interactions, it is often difficult

to tease out the separate effect of adjustment from the effect of the parent-child relationship.

While parents want positive interactions between their children, conflicts are going to arise, and some confrontations can be the impetus for growth in children's social and cognitive skills. The sources of conflict between siblings often depend on their respective ages. Dunn and Munn (1987) revealed that over half of all sibling conflicts in early childhood were disputes about property rights. By middle childhood this starts shifting toward control over social situations, such as what games to play, disagreements about facts or opinions, or rude behavior (Howe, Rinaldi, Jennings, & Petrakos, 2002). Researchers have also found that the strategies children use to deal with conflict change with age, but that this is also tempered by the nature of the conflict.

Abuhatoum and Howe (2013) found that coercive strategies (e.g., threats) were preferred when the dispute centered on property rights, while reasoning was more likely to be used by older siblings and in disputes regarding control over the social situation. However, younger siblings also use reasoning, frequently bringing up the concern of legitimacy (e.g., "You're not the boss") when in conflict with an older sibling. This 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).[\[24\]](#)



Figure 9.14 – Siblings. [25]

Child Care Concerns

About 77.3 percent of mothers of school-aged and 64.2 percent of mothers of preschool-aged children in the United States work outside the home (Cohen and Bianchi, 1999; Bureau of Labor Statistics, 2010). Seventy-five percent of children under age 5 are in scheduled childcare programs. Others are cared for by family members or friends. Older children are often in after school programs, before school programs, or stay at home alone after school once they are older.

Quality childcare programs can enhance a child's social skills and can provide rich learning experiences. But long hours in poor quality care can have negative consequences, especially for young children.

Quality of Care

What determines the quality of child care? One consideration is the **teacher/child ratio**. States specify the maximum number of children that can be supervised by one teacher. In general, the younger the children, the more teachers required for a given number of children. The lower the teacher to child ratio, the more time the teacher has for involvement with the

children and the less stressed the teacher may be so that the interactions can be more relaxed, stimulating and positive. Larger group sizes present challenges to quality as well. The program may be more rigid in rules and structure to accommodate the large number of children in the facility.

The **physical environment** should be engaging, clean, and safe. The **philosophy** of the organization and the **curriculum** available should be child-centered, positive, and stimulating. Providers should be trained in early childhood education. A majority of states do not require training for their childcare providers. And while formal education is not required for a person to provide a warm, loving relationship to a child, knowledge of a child's development is useful for addressing their social, emotional, and cognitive needs in an effective way.



Figure 9.15 – Children playing in a quality childcare environment.
[26]

By working toward improving the quality of childcare and increasing family-friendly workplace policies such as more flexible scheduling and perhaps childcare facilities at places

of employment, we can accommodate families with smaller children and relieve parents of the stress sometimes associated with managing work and family life.[27]

PEERS

Relationships within the family (parent-child and siblings) are not the only significant relationships in a child's life. Peer relationships are also important. Social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011). In peer relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. For example, as preschoolers engage in pretend play they create narratives together, choose roles, and collaborate to act out their stories. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.



Figure 9.16 - Navigating dramatic play provides great opportunities to continue to develop social skills with same-age peers. [28]

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior).Peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept.[\[29\]](#)

PLAY

Freud saw play as a means for children to release pent-up emotions and to deal with emotionally distressing situations in a more secure environment. Vygotsky and Piaget saw play as a way of children developing their intellectual abilities (Dyer & Moneta, 2006). Piaget created stages of play that correspond with his stages of cognitive development. The stages are:

Table 9.2 – Piaget’s Stages of Play[\[30\]](#)

Stage	Description
Functional Play	Exploring, inspecting, and learning through repetitive physical activity.
Symbolic Play	The ability to use objects, actions, or ideas to represent other objects, actions, or ideas and may include taking on roles. [31]
Constructive Play	Involves experimenting with objects to build things [32] ; learning things that were previously unknown with hands on manipulations of materials.
Games with Rules	Imposes rules that must be followed by everyone that is playing; the logic and order involved forms that the foundations for developing game playing strategy [33]

While Freud, Piaget, and Vygotsky looked at play slightly differently, all three theorists saw play as providing positive outcomes for children.

Mildred Parten (1932) observed two to five year-old children and noted six types of play. Three types she labeled as non-social (unoccupied, solitary, and onlooker) and three types were categorized as social play (parallel, associative, and cooperative). The table below describes each type of play. Younger children engage in non-social play more than those who are older; by age five associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006). [\[34\]](#)

Table 9.3 – Parten's Classification of Types of Play[\[35\]](#)

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.

SOCIAL UNDERSTANDING

As we have seen, children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people (leading, for example, to secure or insecure attachments to parents), understanding of how to interact with adults and peers, and developing self-concept based on how others respond to them. These relationships are also significant forums for emotional development.

Remarkably, young children begin developing social understanding very early in life. Before the end of the first year, infants are aware that other people have perceptions, feelings, and other mental states that affect their behavior, and which are different from the child's own mental states. Carefully designed experimental studies show that by late in the preschool years, young children understand that another's beliefs can be mistaken rather than correct, that memories can affect how you feel, and that one's emotions can be hidden from others (Wellman, 2011). Social understanding grows significantly as children's theory of mind develops.

How do these achievements in social understanding occur? One answer is that young children are remarkably sensitive observers of other people, making connections between their emotional expressions, words, and behavior to derive simple inferences about mental states (e.g., concluding, for example, that what Mommy is looking at is in her mind) (Gopnik, Meltzoff, & Kuhl, 2001). This is especially likely to occur in relationships with people whom the child knows well, consistent with the ideas of attachment theory discussed above.



Figure 9.17 – A father speaking to his child. [36]

Growing language skills give young children words with which to represent these mental states (e.g., “mad,” “wants”) and talk about them with others. Thus in conversation with their parents about everyday experiences, children learn much about people’s mental states from how adults talk about them (“Your sister was sad because she thought Daddy was coming home.”) (Thompson, 2006b). Developing social understanding is based on children’s everyday interactions with others and their careful interpretations of what they see and hear. There are also some scientists who believe that infants are biologically prepared to perceive people in a special way, as organisms with an internal mental life, and this facilitates their interpretation of people’s behavior with reference to those mental states (Leslie, 1994).

PERSONALITY

Parents often scrutinize their child’s preferences, characteristics, and responses for clues of a developing personality. They are quite right to do so, because temperament is a foundation for personality growth. But temperament (defined as early-emerging differences in reactivity and self-regulation) is not the whole story. Although temperament is biologically based, it interacts with the influence of experience from the moment of birth (if not before) to shape personality (Rothbart, 2011). Temperamental dispositions are affected, for example, by the support level of parental care. More generally, personality is shaped by the goodness of fit between the child’s temperamental qualities and characteristics of the environment (Chess & Thomas, 1999). For example, an adventurous child whose parents regularly take her on weekend hiking and fishing trips would be a good “fit” to her lifestyle, supporting personality growth. Personality is the result, therefore, of the continuous interplay between biological disposition and experience, as is true for many other aspects of social and personality development.

Personality 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. So an infant that cries frequently doesn't necessarily have a grumpy personality. With sufficient parental support and increased sense of security, the child may develop into a content preschooler that is not likely to cry to get her needs met.



Figure 9.18 – A girl enjoying nature. [37]

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, and 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 observed in wonder upon becomes an adult with a personality of depth and nuance.

SOCIAL AND EMOTIONAL COMPETENCE

Social and personality development is built from the social, biological, and representational influences discussed above. 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 internal standards of conduct (Kochanska, 2002). It emerges from young children's experiences with parents, particularly in the development of a mutually responsive relationship that motivates young children to respond constructively to the parents' requests and expectations. Biologically based temperament is involved, as some children are temperamentally more capable of motivated self-regulation (a quality called effortful control) than are

others, while some children are more prone to the fear and anxiety that parental disapproval can evoke. The development of conscience is influenced by having good fit between the child's temperamental qualities and how parents communicate and reinforce behavioral expectations.

Conscience development also expands as young children begin to represent moral values and think of themselves as moral beings. By the end of the preschool years, for example, young children develop a "moral self" by which they think of themselves as people who want to do the right thing, who feel badly after misbehaving, and who feel uncomfortable when others misbehave. In the development of conscience, young children become more socially and emotionally competent in a manner that provides a foundation for later moral conduct (Thompson, 2012).



Figure 9.19 – This child might be experiencing a guilty conscience. [38]

CHILDHOOD STRESS AND DEVELOPMENT

What is the impact of stress on child development? Children experience different types of stressors. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience **toxic stress** or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008). High levels of the stress hormone cortisol can reduce the size of the hippocampus and effect the child's memory abilities. Stress hormones can also reduce immunity to disease. The brain exposed to long periods of severe stress can develop a low threshold making the child hypersensitive to stress in the future. However, the effects of stress can be minimized if the child has the support of caring adults. Let's take a look at childhood stressors.

Effects of Domestic Abuse

3.3 million children witness domestic violence each year in the US. There has been an increase in acknowledgment that children exposed to domestic abuse during their upbringing will suffer in their developmental and psychological welfare. Because of the awareness of domestic violence that some children have to face, it also generally impacts how the child develops emotionally, socially, behaviorally as well as cognitively. Some emotional and behavioral problems that can result due to domestic violence include increased aggressiveness, anxiety, and changes in how a child socializes with friends, family, and authorities. Bruises, broken bones, head injuries, lacerations, and internal bleeding are some of

the acute effects of a domestic violence incident that require medical attention and hospitalization.

Child Maltreatment

Child abuse is the physical, sexual, or emotional mistreatment or neglect of a child or children. Different jurisdictions have developed their own definitions of what constitutes child abuse for the purposes of removing a child from his/her family and/or prosecuting a criminal charge. There are four major categories of child abuse: neglect, physical abuse, psychological/emotional abuse, and sexual abuse. Neglect is the most common type of abuse in the United States and accounts for over 60 percent of child abuse cases.

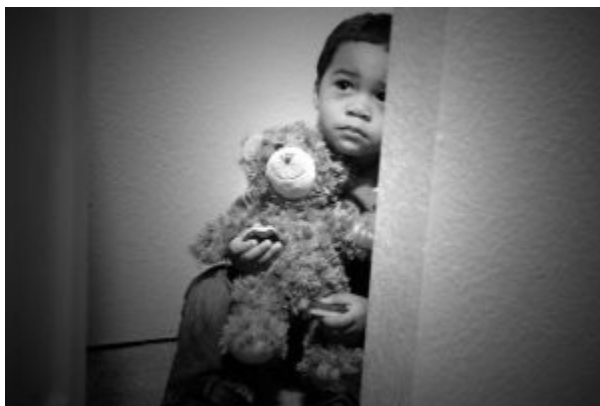


Figure 9.20 – A child hiding. [39]

Physical Abuse

Physical abuse involves physical aggression directed at a child by an adult. Most nations with child-abuse laws consider the deliberate infliction of serious injuries, or actions that place the child at obvious risk of serious injury or death, to be illegal. Beyond this, there is considerable variation. The distinction between child discipline and abuse is often poorly defined. Cultural norms about what constitutes abuse vary widely among professionals as well as the wider public. Some

professionals claim that cultural norms that sanction physical punishment are one of the causes of child abuse, and have undertaken campaigns to redefine such norms.

Sexual Abuse

Child sexual abuse is a form of child abuse in which an adult or older adolescent abuses a child for sexual stimulation. Effects of child sexual abuse include guilt and self-blame, flashbacks, nightmares, insomnia, and fear of things associated with the abuse. Approximately 15 percent to 25 percent of women and 5 percent to 15 percent of men were sexually abused when they were children.

Emotional Abuse

Out of all the possible forms of abuse, emotional abuse is the hardest to define. It could include name-calling, ridicule, degradation, destruction of personal belongings, torture or killing of a pet, excessive criticism, inappropriate or excessive demands, withholding communication, and routine labeling or humiliation.

Neglect

Neglect is a passive form of abuse in which a perpetrator is responsible to provide care for a victim who is unable to care for himself or herself, but fails to provide adequate care. Neglect may include the failure to provide sufficient supervision, nourishment, or medical care, or the failure to fulfill other needs for which the victim is helpless to provide for himself or herself. The term is also applied when necessary care is withheld by those responsible for providing it from animals, plants, and even inanimate objects. Neglect can have many long-term side effects, such as physical injuries, low self-esteem, attention disorders, violent behavior, and even death. In the U.S., neglect is defined as the failure to meet the basic needs of children: housing, clothing, food, and access to medical care. Researchers found over 91,000 cases of neglect in

one year using information from a database of cases verified by protective services agencies.[\[40\]](#)

Conclusion

In this chapter we covered,

- The development of self-concept and self-esteem.
- Erikson's psychosocial stage of initiative versus guilt.
- Gender identity, gender constancy, gender roles, and gender dysphoria.
- Family life, including parenting styles, diverse forms of families, using child care, and the role of siblings.
- The role of peers.
- The types of play.
- The social understanding of preschoolers.
- Personality development
- Social and emotional competences.
- The effects of stress on children, including maltreatment.

In the next chapter we begin exploring middle childhood and how children from 6 to 11 grow and develop.

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CHAPTER 10: MIDDLE CHILDHOOD – PHYSICAL DEVELOPMENT

Chapter Objectives

After this chapter, you should be able to:

1. Describe the patterns of physical growth
2. Summarize nutrition needs
3. Explain the causes of obesity and the negative consequences of excessive weight gain
4. Discuss the pros and cons of organized sports
5. Compare and contrast developmental disorders
6. Summarize several different mental health disorders

INTRODUCTION

Children in middle childhood go through tremendous changes in the growth and development of their brain. During this period of development children's bodies are not only growing, but they are becoming more coordinated and physically capable. These children are more mindful of their greater abilities in school and are becoming more responsible for their health and diet. Some children may be challenged with physical or mental health concerns. It's important to know what typical development looks like in order to identify and to help those that are struggling with health concerns.

BRAIN DEVELOPMENT

The brain reaches its adult size at about age 7. Then between 10 and 12 years of age, the frontal lobes become more developed and improvements in logic, planning, and memory are evident (van der Molen & Molenaar, 1994). The school-aged child is better able to plan and coordinate activity using both the left and right hemispheres of the brain, which control the development of emotions, physical abilities, and intellectual capabilities. The attention span also improves as the prefrontal cortex matures. The myelin also continues to develop and the child's reaction time improves as well. Myelination improvement is one factor responsible for these growths.

From age 6 to 12, the nerve cells in the association areas of the brain, that is those areas where sensory, motor, and intellectual functioning connect, become almost completely myelinated (Johnson, 2005). This myelination contributes to increases in information processing speed and the child's reaction time. The **hippocampus**, which is responsible for transferring information from the short-term to long-term memory, also shows increases in myelination resulting in improvements in memory functioning (Rolls, 2000).



Figure 10.1 – The human brain. [1]

Changes in the brain during this age enable not only physical development, but also allow children to understand what others think of them and dealing socially with the positive and negative consequences of that. Within this development period, children may struggle with mental health disorders or other health problems. As children are growing and becoming more capable, adults need to remember that children don't grow physically in isolation. The development of their bodies isn't separate from the changes that are occurring socially, emotionally, and cognitively. Awareness and understanding of their other developmental domains and needs will support the child during these changes.[\[2\]](#)

PHYSICAL GROWTH

Middle childhood spans the years between early childhood and adolescence, children are approximately 6 to 11 years old. These children come in all shapes and sizes: height, weight, abilities, and disabilities. Physical growth rates are generally slow and steady during these years. However, growth spurts do occur during middle to late childhood (Spreeen, Riser, & Edgell, 1995). Typically, a child will gain about 5-7 pounds a year and

grow about 2 inches per year. They also tend to slim down and gain muscle strength. As bones lengthen and broaden and muscles strengthen, many children want to engage in strenuous physical activity and can participate for longer periods of time. In addition, the rate of growth for the extremities is faster than for the trunk, which results in more adult-like proportions. Long-bone growth stretches muscles and ligaments, which results in many children experiencing growing pains, at night, in particular.[\[3\]](#)

Children between ages 6 and 9, show significant improvement in their abilities to perform motor skills. This development growth allows children to gain greater control over the movement of their bodies, mastering many gross and fine motor skills that were beyond that of the younger child. Riding a bike that is bigger or running longer and further is a big improvement in gross motor skills. Eye-hand coordination and fine motor skills allow for children to become better at writing and cutting. Sports and extracurricular activities may become a part of the lives of children during middle childhood due to their physical growth and capabilities. They are refining their fundamental movements of walking, running, reaching, climbing, jumping, and kicking. The more developed these fundamental movements become, the more coordinated the child will be and the better at sports. There are three main categories of fundamental movement skills:

- Stability movement skills (balancing, rolling, twisting, swinging, etc.)
- Locomotor movement skills (moving from place to place by walking, running, jumping, skipping, climbing, galloping, etc.)
- Manipulative movement skills (managing objects in space, such as throwing, catching, kicking, bouncing, ball rolling, etc.)

Children must be encouraged and instructed to be active and move or these skills will not develop. Children who do not master these fundamental movements are apt to avoid active play and think of themselves as incapable of playing sports. Daily movement has been shown to not only improve our physical health but also our mental health AND success in school.

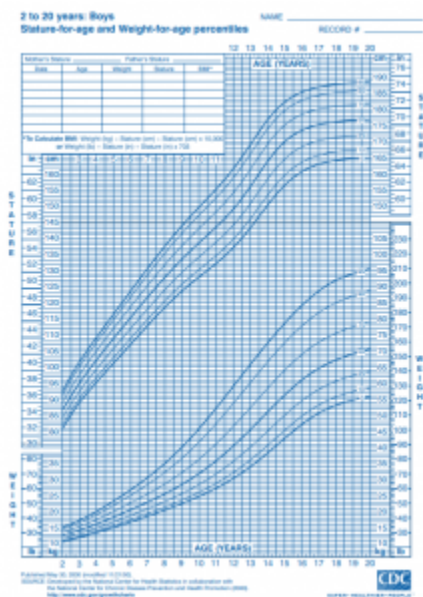


Figure 10.2 – Stature for age and weight for boy's age percentiles. [4]

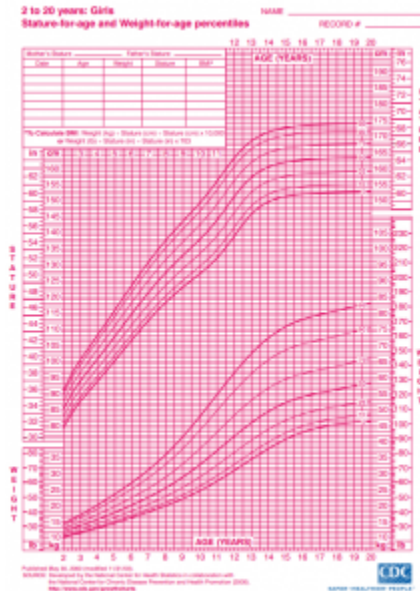


Figure 10.2 – Stature for age and weight for girl's age percentiles. [4]

NUTRITIONAL NEEDS

A number of factors can influence children's eating habits and attitudes toward food. Family environment, societal trends, taste preferences, and messages in the media all impact the emotions that children develop in relation to their diet. Television commercials can entice children to consume sugary products, fatty fast foods, excess calories, refined ingredients, and sodium. Therefore, it is critical that parents and caregivers direct children toward healthy choices. [5]

Parents greatly impact their child's nutritional choices. This time in a child's life provides an opportunity for parents and other caregivers to reinforce good eating habits and to introduce new foods into the diet, while remaining mindful of a child's preferences. Parents should also serve as role models for their children, who will often mimic their behavior and eating

habits. Parents must continue to help their school-aged child establish healthy eating habits and attitudes toward food. Their primary role is to bring a wide variety of health-promoting foods into the home, so that their children can make good choices.[\[6\]](#)

Let's think for a moment about what our parents and grandparents used to eat? What are some of the differences that you may have experienced as a child?

One hundred years ago, as families sat down to dinner, they might have eaten boiled potatoes or corn, leafy vegetables such as cabbage or collards, fresh-baked bread, and, if they were fortunate, a small amount of beef or chicken. Young and old alike benefitted from a sound diet that packed a real nutritional punch. Times have changed. Many families today fill their dinner plates with fatty foods, such as French Fries cooked in vegetable oil, a hamburger that contains several ounces of ground beef, and a white-bread bun, with a single piece of lettuce and a slice or two of tomato as the only vegetables served with the meal.



Figure 10.3 – A modern meal. [7]

Our diet has changed drastically as processed foods, which did not exist a century ago, and animal-based foods now account for a large percentage of our calories. This overemphasis on

processed foods and meat has created a diet that is severely limited in fiber. Fiber is only found in plants, not animals, or processed foods because the food manufacturer removes the fiber during processing. Dietary fiber — found mainly in fruits, vegetables, whole grains and legumes — is probably best known for its ability to prevent or relieve constipation. But foods containing fiber can provide other health benefits as well, such as helping to maintain a healthy weight and lowering your risk of diabetes, heart disease and some types of cancer. Not only has what we eat changed, but the amount of it that we consume has greatly increased as well, as plates and portion sizes have grown much larger. All of these choices impact our health, with short- and long-term consequences as we age. Possible effects in the short-term include excess weight gain and constipation. The possible long-term effects, primarily related to obesity, include the risk of cardiovascular disease, diabetes, hypertension, as well as other health and emotional problems for children. Centers for Disease Control and Prevention. “Overweight and Obesity: Health Consequences.”[8]

During middle childhood, a healthy diet facilitates physical and mental development and helps to maintain health and wellness. School-aged children experience steady, consistent growth, but at a slower rate than they did in early childhood. This slowed growth rate can have lasting a lasting impact if nutritional, caloric, and activity levels aren’t adjusted in middle childhood which can lead to excessive weight gain early in life and can lead to obesity into adolescence and adulthood.[9]

Making sure that children have proper nutrients will allow for optimal growth and development. Look at the figure below to familiarize yourself with food and the place setting for healthy meals. (See also, “[My Healthy Eating Plate](#)” for guidelines that don’t focus on dairy because research has **not** shown a consistent benefit on bone health with high intakes of milk,

and furthermore has suggested potential harm with certain conditions like prostate cancer.[\[10\]](#)



Figure 10.4 – Nutrition guidelines from the USDA. [\[11\]](#)

One way to encourage children to eat healthy foods is to make meal and snack time fun and interesting. Parents should include children in food planning and preparation, for example selecting items while grocery shopping or helping to prepare part of a meal, such as making a salad. At this time, parents can also educate children about kitchen safety. It might be helpful to cut sandwiches, meats, or pancakes into small or interesting shapes. In addition, parents should offer nutritious desserts, such as fresh fruits, instead of calorie-laden cookies, cakes, salty snacks, and ice cream. Studies show that children who eat family meals on a frequent basis consume more nutritious foods.[\[12\]](#)

Energy

Children's energy needs vary, depending on their growth and level of physical activity. Energy requirements also vary according to gender. Girls require 1,200 to 1,400 calories a day from age 2 to 8 and 1,400-1,800 for age 9 to 13. Boys also need 1,200 to 1,400 calories daily from age 4 to 8 but their daily caloric needs go up to 1,600-2,000 from age 9 to 13. This

range represents individual differences, including how active the child is.[\[13\]](#)

Recommended intakes of **macronutrients** (protein, carbohydrates, and fats) and most **micronutrients** (vitamins and minerals) are higher relative to body size, compared with nutrient needs during adulthood. Therefore, children should be provided nutrient-dense food at meal- and snack-time. However, it is important not to overfeed children, as this can lead to childhood obesity, which is discussed in the next section.

Children and Malnutrition

Many may not know that malnutrition is a problem that many children face, in both developing nations and the developed world. Even with the wealth of food in North America, many children grow up malnourished, or even hungry. The US Census Bureau characterizes households into the following groups:

- food secure
- food insecure without hunger
- food insecure with moderate hunger
- food insecure with severe hunger

Millions of children grow up in food-insecure households with inadequate diets due to both the amount of available food and the quality of food. In the United States, about 20 percent of households with children are food insecure to some degree. In half of those, only adults experience food insecurity, while in the other half both adults and children are considered to be food insecure, which means that children did not have access to adequate, nutritious meals at times.[\[14\]](#)

Growing up in a food-insecure household can lead to a number of problems. Deficiencies in iron, zinc, protein, and vitamin A can result in stunted growth, illness, and limited development. Federal programs, such as the National School Lunch Program, the School Breakfast Program, and Summer Feeding Programs, work to address the risk of hunger and malnutrition in school-aged children. They help to fill the gaps and provide children living in food-insecure households with greater access to nutritious meals.[\[15\]](#)

School Lunch Programs[\[16\]](#)

Many school age children eat breakfast, snacks, and lunch at their schools. Therefore, it is important for schools to provide meals that are nutritionally sound. In the United States, more than thirty-one million children from low-income families are given meals provided by the National School Lunch Program. This federally funded program offers low-cost or free breakfast, snacks, and lunches to school facilities. School districts that take part receive subsidies from the US Department of Agriculture (USDA) for every meal they serve that must meet 2015 Dietary Guidelines for Americans.

Knowing that many children in the United States buy or receive free lunches in the school cafeteria, it might be worthwhile to look at the nutritional content of school lunches. You can obtain this information through your local school district's website. An example of a school menu from a school district in north central Texas is a meal consisting of pasta alfredo, bread stick, peach cup, tomato soup, a brownie, and 2% milk which is in compliance with Federal Nutritional Guidelines. Consider another menu from an elementary school in the state of Washington. This sample meal consists of chicken burger, tater tots, fruit, veggies, and 1% or nonfat milk. This meal is also in compliance with Federal Nutrition Guidelines but has about 300 fewer calories than the menu in Texas. This is a big difference in calories and

nutritional value of these prepared lunches that are chosen and approved of by officials on behalf of children in these districts.



Figure 10.6 – Children eating lunch together at school. [17]

Healthy School Lunch Campaigns helps to promote children's health. This is done by educating government officials, school officials, food-service workers, and parents and is sponsored by the Physicians Committee for Responsible Medicine. They educate and encourage schools to offer low-fat, cholesterol-free options in school cafeterias and in vending machines and work to improve the food served to children at school. Unfortunately, many school districts in the nation allow students to purchase chips, cookies, and ice cream along with their meals. These districts rely on the sale of these items in the lunchrooms to earn additional revenues. Not only are they making money off of children and families with junk food, they are also adding additional empty calories to their daily intake. These districts need to look at the menus and determine the rationale for offering additional snacks and desserts for children at their schools. Whether children receive free lunches, buy their own, or bring their lunch from home, quality nutrition is what is best for these growing bodies and minds.

Food Allergies and Food Intolerance

Food intolerance and food allergies are an issue for some school-aged children. Recent studies show that three million children under age eighteen are allergic to at least one type of food.

Some of the most common **food allergies** come from foods that include peanuts, milk, eggs, soy, wheat, and shellfish. An allergy occurs when a protein in food triggers an immune response, which results in the release of antibodies, histamine, and other defenders that attack foreign bodies. Possible symptoms include itchy skin, hives, abdominal pain, vomiting, diarrhea, and nausea. Symptoms usually develop within minutes to hours after consuming a food allergen. Children can outgrow a food allergy, especially allergies to wheat, milk, eggs, or soy.[\[18\]](#)

Anaphylaxis is a life-threatening reaction that results in difficulty breathing, swelling in the mouth and throat, decreased blood pressure, shock, or even death. Milk, eggs, wheat, soybeans, fish, shellfish, peanuts, and tree nuts are the most likely to trigger this type of response. A dose of the drug epinephrine is often administered via a “pen” to treat a person who goes into anaphylactic shock.[\[19\]](#)



Figure 10.7 – An EpiPen. [\[20\]](#)

Some children experience a **food intolerance**, which does not involve an immune response. A food intolerance is marked by unpleasant symptoms that occur after consuming certain foods. Lactose intolerance, though rare in very young children, is one example. Children who suffer from this condition experience an adverse reaction to the lactose in milk products. It is a result of the small intestine’s inability to produce enough

of the enzyme lactase. Symptoms of lactose intolerance usually affect the gastro-intestinal tract and can include bloating, abdominal pain, gas, nausea, and diarrhea. An intolerance is best managed by making dietary changes and avoiding any foods that trigger the reaction.[\[21\]](#)

Being Overweight and Obesity in Children

Excess weight and obesity in children is associated with a variety of medical conditions including high blood pressure, insulin resistance, inflammation, depression, and lower academic achievement (Lu, 2016). Being overweight has also been linked to impaired brain functioning, which includes deficits in executive functioning, working memory, mental flexibility, and decision making (Liang, Matheson, Kaye, & Boutelle, 2014). Children who ate more saturated fats performed worse on relational memory tasks, while eating a diet high in omega-3 fatty acids promoted relational memory skills (Davidson, 2014). Using animal studies, Davidson et al. (2013) found that large amounts of processed sugars and saturated fat weakened the blood-brain barrier, especially in the hippocampus. This can make the brain more vulnerable to harmful substances that can impair its functioning. Another important executive functioning skill is controlling impulses and delaying gratification. Children who are overweight show less inhibitory control than normal weight children, which may make it more difficult for them to avoid unhealthy foods (Lu, 2016). Overall, being overweight as a child increases the risk for cognitive decline as one ages.



Figure 10.8 – There are certain health risks associated with being overweight. [22]

The current measurement for determining excess weight is the **Body Mass Index (BMI)** which expresses the relationship of height to weight. According to the Centers for Disease Control and Prevention (CDC), childrens whose BMI is at or above the 85th percentile for their age are considered **overweight**, while children who are at or above the 95th percentile are considered **obese** (Lu, 2016). In 2011-2012 approximately 8.4% of 2-5 year-olds were considered overweight or obese, and 17.7% of 6-11 year-olds were overweight or obese (CDC, 2014b).[\[23\]](#)

Obesity Rates for Children: About 16 to 33 percent of American children are obese (U. S. Department of Health and Human Services, 2005). This is defined as being at least 20 percent over their ideal weight. The percentage of obesity in school-aged children has increased substantially since the 1960s and has in fact doubled since the 1980s. This is true in part because of the introduction of a steady diet of television and other sedentary activities. In addition, we have come to emphasize high fat, fast foods as a culture. Pizza, hamburgers,

chicken nuggets and “lunchables” with soda have replaced more nutritious foods as staples. The decreased participation in school physical education and youth sports is just one of many factors that has led to an increase in children being overweight or obese.

Being Overweight Can Be a Lifelong Struggle

A growing concern is the lack of recognition from parents that children are overweight or obese. Katz (2015) referred to this as “**oblivobesity**”. Black et al. (2015) found that parents in the United Kingdom (UK) only recognized their children as obese when they were above the 99.7th percentile while the official cut-off for obesity is at the 85th percentile. Oude Luttikhuis, Stolk, and Sauer (2010) surveyed 439 parents and found that 75% of parents of overweight children said the child had a normal weight and 50% of parents of obese children said the child had a normal weight. For these parents, overweight was considered normal and obesity was considered normal or a little heavy. Doolen, Alpert, and Miller (2009) reported on several studies from the United Kingdom, Australia, Italy, and the United States, and in all locations parents were more likely to misperceive their children’s weight. Black, Park, and Gregson (2015) concluded that as the average weight of children rises, what parents consider normal also rises. If parents cannot identify if their children are overweight they will not be able to intervene and assist their children with proper weight management.

An added concern is that the children themselves are not accurately identifying if they are overweight. In a United States sample of 8-15 year-olds, more than 80% of overweight boys and 70% of overweight girls misperceived their weight as normal (Sarafrazi, Hughes, & Borrud, 2014). Also noted was that as the socioeconomic status of the children rose, the frequency of these misconceptions decreased. It appeared that

families with more resources were more conscious of what defines a healthy weight.

Results of Childhood Obesity

Children who are overweight tend to be rejected, ridiculed, teased and bullied by others (Stopbullying.gov, 2016). This can certainly be damaging to their self-image and popularity. In addition, obese children run the risk of suffering orthopedic problems such as knee injuries, and they have an increased risk of heart disease and stroke in adulthood (Lu, 2016). It is hard for a child who is obese to become a non-obese adult. In addition, the number of cases of pediatric diabetes has risen dramatically in recent years.

Behavioral interventions, including training children to overcome impulsive behavior, are being researched to help overweight children (Lu, 2016). Practicing inhibition has been shown to strengthen the ability to resist unhealthy foods. Parents can help their overweight children the best when they are warm and supportive without using shame or guilt. They can also act like the child's frontal lobe until it is developed by helping them make correct food choices and praising their efforts (Liang, et al., 2014). Research also shows that exercise, especially aerobic exercise, can help improve cognitive functioning in overweight children (Lu, 2016). Parents should take caution against emphasizing diet alone to avoid the development of any obsession about dieting that can lead to eating disorders. Instead, increasing a child's activity level is most helpful.

Dieting is not really the answer. If you diet, your basal metabolic rate tends to decrease thereby making the body burn even fewer calories in order to maintain the weight. Increased activity is much more effective in lowering the weight and improving the child's health and psychological well-being. Exercise reduces stress and being an overweight child, subjected to the ridicule of others can certainly be stressful.

Parents should take caution against emphasizing diet alone to avoid the development of any obsession about dieting that can lead to eating disorders as teens. Again, helping children to make healthy food choices and increasing physical activity will help prevent childhood obesity.[\[24\]](#)

EXERCISE, PHYSICAL FITNESS, AND SPORTS

Recess and Physical Education: Recess is a time for free play and Physical Education (PE) is a structured program that teaches skills, rules, and games. They're a big part of physical fitness for school age children. For many children, PE and recess are the key component in introducing children to sports. After years of schools cutting back on recess and PE programs, there has been a turn around, prompted by concerns over childhood obesity and the 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).



Figure 10.10 – A girl running on a track field. [25]

Organized Sports: Pros and Cons

Middle childhood seems to be a great time to introduce children to organized sports, and in fact, many parents do. Nearly 3 million children play soccer in the United States (United States Youth Soccer, 2012). This activity promises to help children build social skills, improve athletically and learn a sense of competition. However, 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.

This study also found that fathers may not be providing their daughters as much support as they do their sons. While boys rated their fathers as their biggest mentor who taught them the most about sports, girls rated coaches and physical education teachers as their key mentors. Sabo and Veliz also found that children in suburban neighborhoods had a much higher participation in sports than boys and girls living in rural or urban centers. In addition, Caucasian girls and boys participated in organized sports at higher rates than minority children. With a renewed focus, males and females can benefit from all sports and physical activity.[\[26\]](#)



Figure 10.11 – Community sports. [27]

Welcome to the World of E-Sports

The recent Sport Policy and Research Collaborative (2016) report on the “State of Play” in the United States highlights a disturbing trend. One in four children between the ages of 5 and 16 rate playing computer games with their friends as a form of exercise. In addition, **e-sports**, which as SPARC writes is about as much a sport as poker, involves children watching other children play video games. Over half of males, and about 20% of females, aged 12-19, say they are fans of e-sports. Play is an important part of childhood and physical activity has been proven to help children develop and grow. Adults and caregivers should look at what children are doing within their day to prioritize the activities that should be focused on.[\[28\]](#)



Figure 10.12 – A group of boys playing video sports. [29]

PHYSICAL HEALTH

Vision and Hearing

The most common vision problem in middle childhood is being nearsighted, otherwise known as Myopic. 25% of children will be diagnosed by the end of middle childhood. Being nearsighted can be corrected by wearing glasses with corrective lenses.



Figure 10.13 – A child receiving an eye exam. [30]

Children may have many ear infections in early childhood, but it's not as common within the 6-12 year age range. Numerous ear infections during middle childhood may lead to headaches and migraines, which may result in hearing loss.[\[31\]](#)

Dental Health

Children in middle childhood will start or continue to lose teeth. They experience the loss of deciduous, or “baby,” teeth and the arrival of permanent teeth, which typically begins at age six or seven. It is important for children to continue seeing a dentist twice a year to be sure that these teeth are healthy.

The foods and nutrients that children consume are also important for dental health. Offer healthy foods and snacks to children and when children do eat sugary or sticky foods, they should brush their teeth afterward.



Figure 10.14 – A boy brushing his teeth. [\[32\]](#)

Children should floss daily and brush their teeth at least twice daily: in the morning, at bedtime, and preferably after meals. Younger children need help brushing their teeth properly. Try brushing their teeth first and letting them finish. You might try using a timer or a favorite song so that your child learns to brush for 2 minutes. Parents or caregivers are encouraged to supervise brushing until your child is 7 or 8 years old to avoid tooth decay.

The best defense against tooth decay is flossing, brushing and adding fluoride; a mineral found in most tap water. If your water doesn't have fluoride, ask a dentist about fluoride drops, gel or varnish. Also ask your child's dentist about sealants—a simple, pain-free way to prevent tooth decay. These thin plastic coatings are painted on the chewing surfaces of permanent back teeth. They quickly harden to form a protective shield against germs and food. If a small cavity is accidentally covered by a sealant, the decay won't spread because germs trapped inside are sealed off from their food supply.

Children's dental health needs continuous monitoring as children loose teeth and new teeth come in. Many children have some malocclusion (when the way upper teeth aren't correctly positioned slightly over the lower teeth, including under- and overbites) or malposition of their teeth, which can affect their ability to chew food, floss, and brush properly. Dentists may recommend that it's time to see an orthodontist to maintain proper dental health. Dental health is exceedingly important as children grow more independent by making food choices and as they start to take over flossing and brushing. Parents can ease this transition by promoting healthy eating and proper dental hygiene.[\[33\]](#)

Diabetes in Childhood

Until recently diabetes in children and adolescents was thought of almost exclusively as type 1, but that thinking has evolved. Type 1 diabetes is the most common form of diabetes in

children and is the result of a lack or production of insulin due to an overactive immune system. Type 2 diabetes is the most common form of diabetes in the U.S. It used to be referred to as adult-onset diabetes as it was not common during childhood. But with increasing rates of overweight and obesity in children and adolescents, more diagnoses are happening before adulthood. It is also important to note that Type 2 disproportionately affects minority youth.[\[34\]](#)



Figure 10.15 – The finger-prick test. [35]

Asthma

Childhood asthma that is unmanaged may make it difficult for children to develop to their fullest potential. Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and [coughing](#). The coughing often occurs at night or early in the morning. Asthma affects people of all ages, but it most often starts during childhood. In the United States, more than 25 million people are known to have asthma. About 7 million of these people are children.

To understand asthma, it helps to know how the [airways](#) work. The airways are tubes that carry air into and out of your lungs. People who have asthma have inflamed airways. The inflammation makes the airways swollen and very sensitive.

The airways tend to react strongly to certain inhaled substances. When the airways react, the muscles around them tighten. This narrows the airways, causing less air to flow into the lungs. The swelling also can worsen, making the airways even narrower. Cells in the airways might make more mucus than usual. Mucus is a sticky, thick liquid that can further narrow the airways. This chain reaction can result in asthma symptoms. Symptoms can happen each time the airways are inflamed.

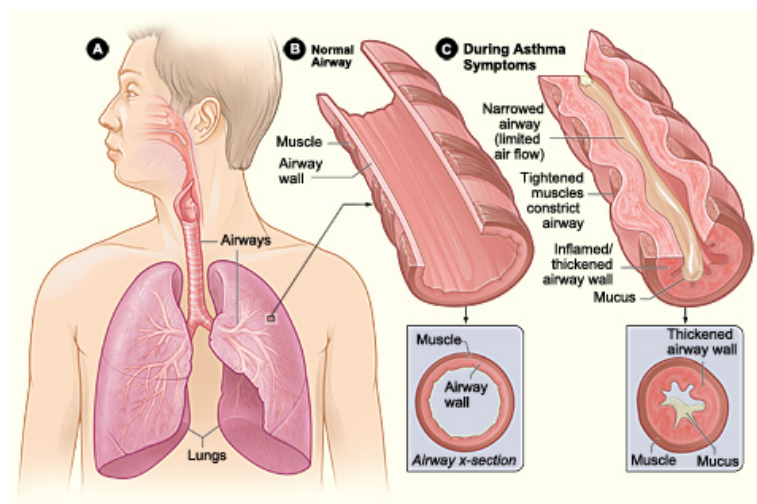


Figure 10.16 – Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms. [36]

Sometimes asthma symptoms are mild and go away on their own or after minimal treatment with asthma medicine. Other times, symptoms continue to get worse. When symptoms get more intense and/or more symptoms occur, you're having an asthma attack. Asthma attacks also are called flare-ups or exacerbations (eg-zas-er-BA-shuns).



Figure 10.17 – The different things that can trigger asthma. [37]

Treating symptoms when you first notice them is important. This will help prevent the symptoms from worsening and causing a severe asthma attack. Severe asthma attacks may require emergency care, and they can be fatal. Asthma has no cure. Even when you feel fine, you still have the disease and it can flare up at any time.

However, with today's knowledge and treatments, most people who have asthma are able to manage the disease. They have few, if any, symptoms. They can live normal, active lives and sleep through the night without interruption from asthma. If you have asthma, you can take an active role in managing the disease. For successful, thorough, and ongoing treatment, build strong partnerships with your doctor and other health care providers.[38]

Childhood Stress

Take a moment to think about how you deal with and how stress affects you. Now think about what the impact of stress may have on a child and their development?

Of course children experience stress and different types of stressors differently. Not all stress is bad. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience toxic stress or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008). High levels of the stress hormone cortisol can reduce the size of the hippocampus and effect the child's memory abilities. Stress hormones can also reduce immunity to disease. If the brain is exposed to long periods of severe stress it can develop a low threshold making the child hypersensitive to stress in the future. Whatever the effects of stress, it can be minimized if a child learns to deal with stressors and develop coping strategies with the support of caring adults. It's easy to know when your child has a fever or other physical symptoms. However, a child's mental health problems may be harder to identify. In the next section, we'll look at childhood Mental Health Disorders.[\[39\]](#)



Figure 10.18 – High, constant levels of stress can negatively impact the brain. [40]

CHILDHOOD MENTAL HEALTH

Mental health problems can disrupt daily life at home, at school or in the community. Without help, mental health problems can lead to school failure, alcohol or other drug abuse, family discord, violence or even suicide. However, help is available. Talk to your health care provider if you have concerns about your child's behavior.

Mental health disorders are diagnosed by a qualified professional using the Diagnostic and Statistical Manual of Mental Disorders (DSM). This is a manual that is used as a standard across the profession for diagnosing and treating mental disorders.[\[41\]](#)

When You Have a Concern About a Child. What's in a Label? [\[42\]](#)

Children are continually evaluated as they enter and progress through school. If a child is showing a need, they should be assessed by a qualified professional who would make a recommendation or diagnosis of the child and give the type of instruction, resources, accommodations, and support that they should receive.

Ideally, a proper diagnosis or label is extremely beneficial for children who have educational, social, emotional, or developmental needs. Once their difficulty, disorder, or disability is labeled then the child will receive the help they need from parents, educators and any other professionals who will work as a team to meet the student's individual goals and needs.

However, it's important to consider that children that are labeled without proper support and accommodations or worse they may be misdiagnosed will have negative consequences. A label can also influence the child's self-concept, for example, if a child is misdiagnosed as having a learning disability; the child, teachers, and family member interpret their actions through the lens of that label. Labels are powerful and can be good for the child or they can go detrimental for their development all depending on the accuracy of the label and if they are accurately applied.

A team of people who include parents, teachers, and any other support staff will look at the child's evaluation assessment in a process called an Individual Education Plan (IEP). The team will discuss the diagnosis, recommendations, and the accommodations or help and a decisions will be made regarding what is the best for the child. This is time when parents or caregivers decide if they would like to follow this plan or they can dispute any part of the process. During an IEP, the team is able to voice concerns and questions. Most parents feel empowered when they leave these meetings. They feel as if they

are a part of the team and that they know what, when, why, and how their child will be helped.

Childhood Mental Health Disorders

Social and Emotional Disorders

- Phobias
- Anxiety
- Post-Traumatic Stress Syndrome – PTSD
- Obsessive Compulsive Disorder –OCD
- Depression

Developmental Disorders

- Autism Spectrum Disorder (ASD)
- Attention Deficit Disorder (ADHD)
- Pervasive Developmental Disorder (PDD)[\[43\]](#)

Phobias

When a child who has a **phobia** (an extreme or irrational fear of or aversion to something) is exposed to the phobic stimulus (the stimuli varies), it almost invariably provokes an immediate anxiety response, which may take the form of a situational bound or situational predisposed panic attack. Children can show effects and characteristics when it comes to specific phobias. The effects of anxiety show up by crying, throwing tantrums, experiencing freezing, or clinging to the parent that they have the most connection with. Related Conditions include anxiety.

Anxiety

Many children have fears and worries, and will feel sad and hopeless from time to time. Strong fears will appear at different times during development. For example, toddlers are often very distressed about being away from their parents, even if they are safe and cared for. Although fears and worries are typical in children, persistent or extreme forms of fear and sadness feelings could be due to anxiety or depression. Because the symptoms primarily involve thoughts and feelings, they are called **internalizing disorders**.



Figure 10.19 – An anxious child. [44]

When children do not outgrow the fears and worries that are typical in young children, or when there are so many fears and worries that interfere with school, home, or play activities, the child may be diagnosed with an anxiety disorder. Examples of different types of anxiety disorders include:

- Being very afraid when away from parents (separation anxiety)
- Having extreme fear about a specific thing or situation, such as dogs, insects, or going to the doctor (phobias)
- Being very afraid of school and other places where there are people (social anxiety)

- Being very worried about the future and about bad things happening (general anxiety)
- Having repeated episodes of sudden, unexpected, intense fear that come with symptoms like heart pounding, having trouble breathing, or feeling dizzy, shaky, or sweaty (panic disorder)

Anxiety may present as fear or worry, but can also make children irritable and angry. Anxiety symptoms can also include trouble sleeping, as well as physical symptoms like fatigue, headaches, or stomachaches. Some anxious children keep their worries to themselves and, thus, the symptoms can be missed.

Related conditions include Obsessive-Compulsive Disorder and Post Traumatic Stress Disorder.

Post-Traumatic Stress Syndrome (PTSD)

Exposure to traumatic events can have major developmental influences on children. While the majority of children will not develop PTSD after a trauma, best estimates from the literature are that around a third of them will, higher than adult estimates. Some reasons for this could include more limited knowledge about the world, differential coping mechanisms employed, and the fact that children's reactions to trauma are often highly influenced by how their parents and caregivers react.

The impact of PTSD on children weeks after a trauma, show that up to 90% of children may experience heightened physiological arousal, diffuse anxiety, survivor guilt, and emotional lability. These are all normal reactions and should be understood as such (similar things are seen in adults. Those children still having these symptoms three or four months after a disaster, however, may be in need of further assessment, particularly if they show the following symptoms as well. For

older children, warning signs of problematic adjustment include: repetitious play reenacting a part of the disaster; preoccupation with danger or expressed concerns about safety; sleep disturbances and irritability; anger outbursts or aggressiveness; excessive worry about family or friends; school avoidance, particularly involving somatic complaints; behaviors characteristic of younger children; and changes in personality, withdrawal, and loss of interest in activities.[\[45\]](#)

Obsessive Compulsive Disorder (OCD)

Although a diagnosis of OCD requires only that a person either has obsessions or compulsions, not both, approximately 96% of people experience both. For almost all people with OCD, being exposed to a certain stimuli (internal or external) will then trigger an upsetting or anxiety-causing obsession, which can only be relieved by doing a compulsion. For example, a person touches a doorknob in a public building, which causes an obsessive thought that they will get sick from the germs, which can only be relieved by compulsively washing their hands to an excessive degree. Some of the most common obsessions include unwanted thoughts of harming loved ones, persistent doubts that one has not locked doors or switched off electrical appliances, intrusive thoughts of being contaminated, and morally or sexually repugnant.[\[46\]](#)

Depression

Occasionally being sad or feeling hopeless is a part of every child's life. However, some children feel sad or uninterested in things that they used to enjoy, or feel helpless or hopeless in situations where they could do something to address the situations. When children feel persistent sadness and hopelessness, they may be diagnosed with depression.



Figure 10.20 – Persistent sadness is a symptom of depression. [47]

Symptoms

We now know that youth who have depression may show signs that are slightly different from the typical adult symptoms of depression. Children who are depressed may complain of feeling sick, refuse to go to school, cling to a parent or caregiver, feel unloved, hopelessness about the future, or worry excessively that a parent may die. Older children and teens may sulk, get into trouble at school, be negative or grouchy, are irritable, indecisive, have trouble concentrating, or feel misunderstood. Because normal behaviors vary from one childhood stage to another, it can be difficult to tell whether a child who shows changes in behavior is just going through a temporary “phase” or is suffering from depression.

Treatment

With medication, psychotherapy, or combined treatment, most youth with depression can be effectively treated. Youth are more likely to respond to treatment if they receive it early in the course of their illness.[\[48\]](#)

Developmental Disorders

Autism Spectrum Disorder

As introduced in chapter 8, autism spectrum disorder (ASD) is a developmental disorder that affects communication and behavior. Although autism can be diagnosed at any age, it is said to be a “developmental disorder” because symptoms generally appear in the first two years of life.

According to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, a guide created by the American Psychiatric Association used to diagnose mental disorders, people with ASD have:

- Difficulty with communication and interaction with other people
- Restricted interests and repetitive behaviors
- Symptoms that hurt the person’s ability to function properly in school, work, and other areas of life

Autism is known as a “spectrum” disorder because there is wide variation in the type and severity of symptoms people experience. ASD occurs in all ethnic, racial, and economic groups. Although ASD can be a lifelong disorder, treatments and services can improve a person’s symptoms and ability to function. The American Academy of Pediatrics recommends that all children be screened for autism.

Changes to the diagnosis of ASD

In 2013, a revised version of the [*Diagnostic and Statistical Manual of Mental Disorders \(DSM\)*](#) was released. This revision changed the way autism is classified and diagnosed. Using the previous version of the *DSM*, people could be diagnosed with one of several separate conditions:

- Autistic disorder

- Asperger's syndrome
- Pervasive developmental disorder not otherwise specified (PDD-NOS)

In the current revised version of the *DSM* (the *DSM-5*), these separate conditions have been combined into one diagnosis called “autism spectrum disorder.” Using the *DSM-5*, for example, people who were previously diagnosed as having Asperger's syndrome would now be diagnosed as having autism spectrum disorder. Although the “official” diagnosis of ASD has changed, there is nothing wrong with continuing to use terms such as Asperger's syndrome to describe oneself or to identify with a peer group.

Signs and Symptoms of ASD

People with ASD have difficulty with social communication and interaction, restricted interests, and repetitive behaviors. The list below gives some examples of the types of behaviors that are seen in people diagnosed with ASD. Not all people with ASD will show all behaviors, but most will show several.

- Social communication / interaction behaviors may include:
 - Making little or inconsistent eye contact
 - Tending not to look at or listen to people
 - Rarely sharing enjoyment of objects or activities by pointing or showing things to others
 - Failing to, or being slow to, respond to someone calling their name or to other verbal attempts to gain attention
 - Having difficulties with the back and forth of conversation
 - Often talking at length about a favorite subject without noticing that others are not interested or without giving others a chance to respond

- Having facial expressions, movements, and gestures that do not match what is being said
- Having an unusual tone of voice that may sound sing-song or flat and robot-like
- Having trouble understanding another person's point of view or being unable to predict or understand other people's actions

Restrictive / repetitive behaviors may include:

- Repeating certain behaviors or having unusual behaviors. For example, repeating words or phrases, a behavior called *echolalia*
- Having a lasting intense interest in certain topics, such as numbers, details, or facts
- Having overly focused interests, such as with moving objects or parts of objects
- Getting upset by slight changes in a routine
- Being more or less sensitive than other people to sensory input, such as light, noise, clothing, or temperature

People with ASD may also experience sleep problems and irritability. Although people with ASD experience many challenges, they may also have many strengths, including:

- Being able to learn things in detail and remember information for long periods of time
- Being strong visual and auditory learners
- Excelling in math, science, music, or art

Causes and Risk Factors

While scientists don't know the exact causes of ASD, research suggests that genes can act together with influences from the environment to affect development in ways that lead to ASD. Although scientists are still trying to understand why some people develop ASD and others don't, some risk factors include:

- Having a sibling with ASD
- Having older parents
- Having certain genetic conditions—people with conditions such as Down syndrome, fragile X syndrome, and Rett syndrome are more likely than others to have ASD
- Very low birth weight

Treatments and Therapies

Treatment for ASD should begin as soon as possible after diagnosis. Early treatment for ASD is important as proper care can reduce individuals' difficulties while helping them learn new skills and make the most of their strengths.

The wide range of issues facing people with ASD means that there is no single best treatment for ASD. Working closely with a doctor or health care professional is an important part of finding the right treatment program.

A doctor may use medication to treat some symptoms that are common with ASD. With medication, a person with ASD may have fewer problems with:

- Irritability
- Aggression
- Repetitive behavior
- Hyperactivity

- Attention problems
- Anxiety and depression

People with ASD may be referred to doctors who specialize in providing behavioral, psychological, educational, or skill-building interventions. These programs are typically highly structured and intensive and may involve parents, siblings, and other family members. Programs may help people with ASD:

- Learn life-skills necessary to live independently
- Reduce challenging behaviors
- Increase or build upon strengths
- Learn social, communication, and language skills [\[49\]](#)



Figure 10.21 – Rich and Nubia Quick have put their autistic 8-year-old son, Matthew, through therapy to help him open up and relate more to others. The Quicks maintain a structured environment so Matthew can better adjust to the world around him. [50]

Attention Deficit/Hyperactivity Disorder (AD/HD)

The exact causes of AD/HD are unknown; however, research has demonstrated that factors that many people associate with the development of AD/HD do not cause the disorder including, minor head injuries, damage to the brain from complications during birth, food allergies, excess sugar intake, too much television, poor schools, or poor parenting. Research has found a number of significant risk factors affecting neurodevelopment and behavior expression. Events such as maternal alcohol and tobacco use that affect the development of the fetal brain can increase the risk for AD/HD. Injuries to the brain from environmental toxins such as lack of iron have also been implicated.

Symptoms

People with AD/HD show a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with functioning or development:

1. Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often has trouble organizing tasks and activities.

- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted
- Is often forgetful in daily activities.



Figure 10.22 – This child is exhibiting inattention. [51]

2. Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:

- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not

appropriate (adolescents or adults may be limited to feeling restless).

- Often unable to play or take part in leisure activities quietly.
- Is often “on the go” acting as if “driven by a motor”.
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games)



Figure 10.23 – This child is exhibiting hyperactivity and impulsivity. [52]

In addition, the following conditions must be met:

- Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.

- Several symptoms are present in two or more settings, (such as at home, school or work; with friends or relatives; in other activities).
- There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.
- The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.

Based on the types of symptoms, three kinds (presentations) of AD/HD can occur:

- **Combined Presentation:** if enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months
- **Predominantly Inattentive Presentation:** if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months
- **Predominantly Hyperactive-Impulsive Presentation:** if enough symptoms of hyperactivity-impulsivity, but not inattention, were present for the past six months.

Because symptoms can change over time, the presentation may change over time as well.[\[53\]](#)

The diagnosis of AD/HD can be made reliably using well-tested diagnostic interview methods. However, as of yet, there is no independent valid test for ADHD.

Among children, AD/HD frequently occurs along with other learning, behavior, or mood problems such as learning disabilities, oppositional defiant disorder, anxiety disorders, and depression.

Treatment

A variety of medications and behavioral interventions are used to treat AD/HD. The most widely used medications are methylphenidate (Ritalin), D-amphetamine, and other amphetamines. These drugs are stimulants that affect the level of the neurotransmitter dopamine at the synapse. Nine out of 10 children improve while taking one of these drugs.

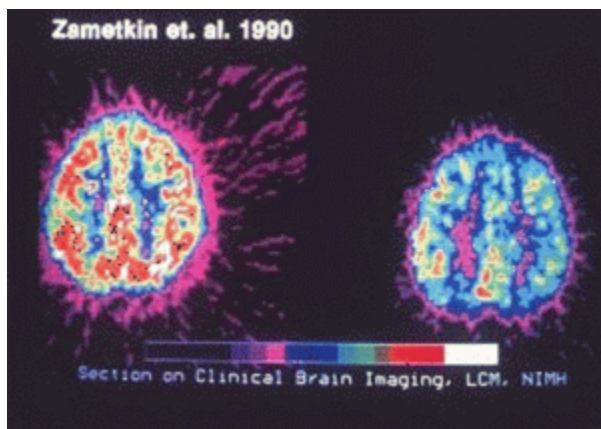


Figure 10.24 – Brain scans of brains with and without ADHD. [54]

In addition to the well-established treatments described above, some parents and therapists have tried a variety of nutritional interventions to treat AD/HD. A few studies have found that some children benefit from such treatments. Nevertheless, no well-established nutritional interventions have consistently been shown to be effective for treating AD/HD.[55]

Pervasive Developmental Disorder (PDD) or PPD (NOS) Not Otherwise Specified PDD –NOS

Pervasive developmental disorder (PDD) is a term used to refer to difficulties in socialization and delays in developing communicative skills. This is usually recognized before 3 years of age. A child with PDD may interact in unusual ways with toys, people, or situations, and may engage in repetitive movement. PDD is diagnosed and treatment is similar to

ADHA and ASD. In 2013 the DSM- 5 discontinued using this as a diagnosis, however it is still used informally.[\[56\]](#)

MANAGING SYMPTOMS: STAYING HEALTHY

Being healthy is important for all children and can be especially important for children with mental health disorders. In addition to getting the right treatment, leading a healthy lifestyle can play a role in managing symptoms. Here are some healthy behaviors that may help:

- Eating a healthful diet centered on fruits, vegetables, whole grains, legumes (for example, beans, peas, and lentils), lean protein sources, and nuts and seeds
- Participating in physical activity for at least 60 minutes each day
- Getting the recommended amount of sleep each night based on age
- Practicing mindfulness or relaxation techniques[\[57\]](#)



Figure 10.25 – Staying healthy is critical for all children, especially those who may have mental health disorders. [58]

Conclusion

Conclusion

In this chapter we looked at:

- Patterns of growth in the brain and body
- Health and nutrition
- Causes and results of obesity
- Exercise, fitness, and organized sports
- Physical health concerns
- Mental health disorders

In the next chapter we will be examining cognitive development theories and theorists. We will learn about information processing; attention, memory, and planning in middle childhood. We will also see how school age children learn language and how intelligence is measured.

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CHAPTER 11: MIDDLE CHILDHOOD – COGNITIVE DEVELOPMENT

Chapter Objectives

After this chapter, you should be able to:

1. Describe what cognitive theorists share about children and their thinking
2. Explain how intelligence is measured, the tests used to assess intelligence, the extremes in intelligence, and the concern of bias
3. Describe the Information Processing Theory
4. Explain several theories of language development
5. Compare typical language development with language difficulties

INTRODUCTION

Cognitive skills continue to expand in middle and late childhood. Children in middle childhood have thought processes that become more logical and organized when dealing with concrete information. Children at this age understand concepts such as past, present, and future, giving them the ability to plan and work toward goals. Additionally, they can process complex ideas such as addition and subtraction and cause-and effect relationships.[\[1\]](#)

COGNITIVE THEORIES OF INTELLIGENCE

Theorists are able to give different perspectives to the cognitive development of children and psychologists have long debated how to best conceptualize and measure intelligence (Sternberg, 2003). In the next section we'll look at Piaget's theory of cognitive development, Sternberg's alternative view to intelligence, and Gardener's theory of multiple intelligence. Lastly, you'll learn about the Information Processing Theory that looks at the cognitive function of children in middle childhood.



Figure 11.1 – Jean Piaget. [2]

PIAGET'S THEORY OF COGNITIVE DEVELOPMENT

Concrete Operational Thought

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.[3]



Figure 11.2 – Children studying. [4]

The concrete operational stage is defined as the third in Piaget’s theory of cognitive development. This stage takes place around 7 years old to 11 years of age, and is characterized by the development of organized and rational thinking. Piaget (1954a) considered the concrete stage a major turning point in the child’s cognitive development, because it marks the beginning of logical or operational thought. The child is now mature enough to use logical thought or operations (i.e. rules) but can only apply logic to physical objects (hence concrete operational). Children gain the abilities of conservation (number, area, volume, orientation) and reversibility.[5]

Let’s look at the following cognitive skills that children typically master during Piaget’s concrete operational stage.[6] :

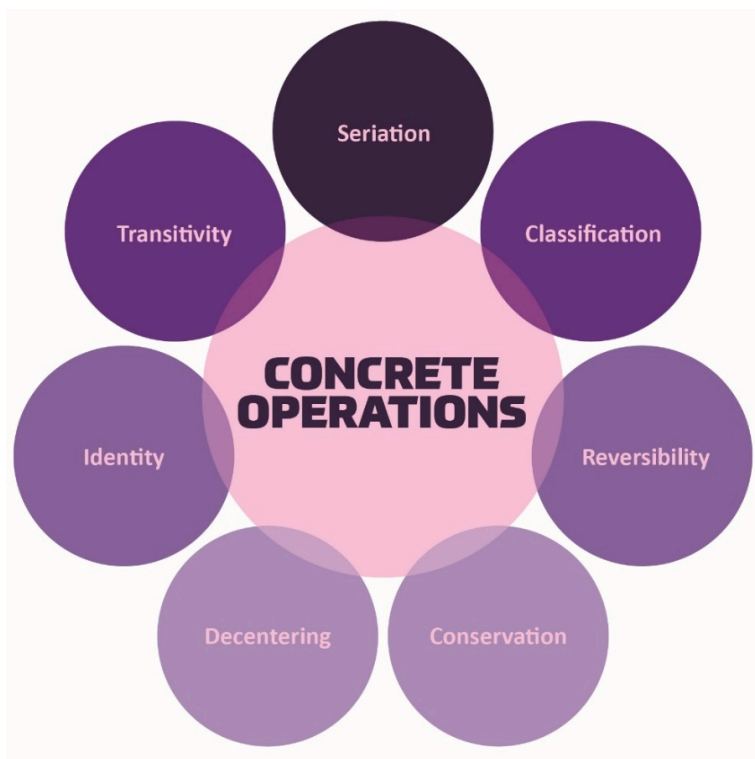


Figure 11.3 – The cognitive skills developed during the concrete operational stage. [7]

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, while younger children approach a similar task in a haphazard way.[\[8\]](#)

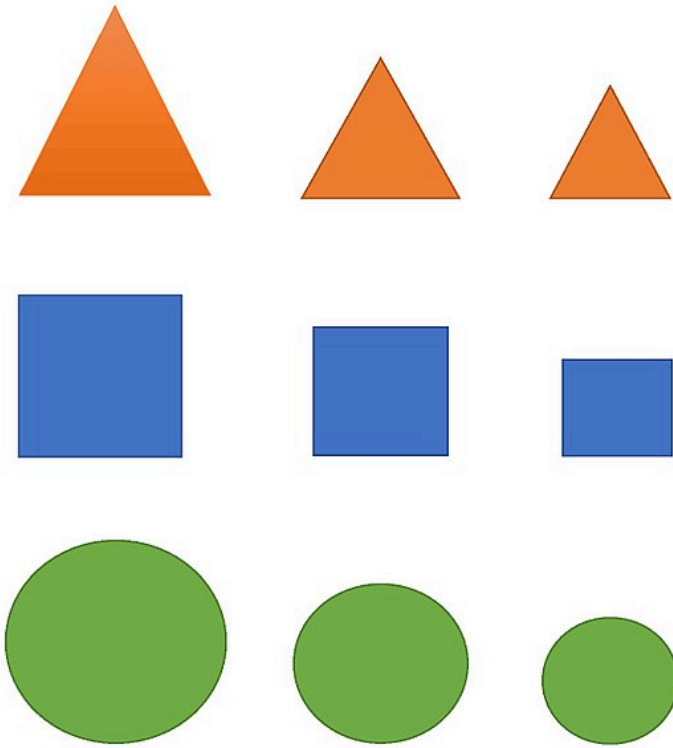


Figure 11.4 – Putting these rectangles from smallest to largest is seriation. [9]

Classification: As children’s experiences and vocabularies grow, they build **schema** 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 11.5 – This child might use classification if she sorts these toys by color. [10]

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.



Figure 11.6 – Understanding that ice cubes melt is an example of reversibility. [11]

Conservation: An example of the preoperational child's thinking; if you were to fill a tall beaker with 8 ounces of water this child would think that it 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.

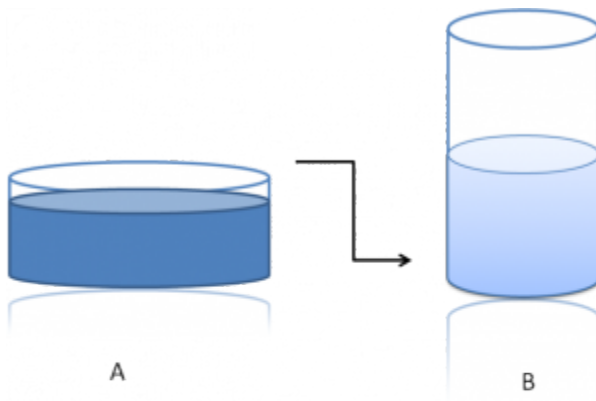


Figure 11.7 – Beakers displaying the idea of conservation. [12]

Decentration: Concrete operational children no longer focus on only one dimension of any object (such as the height of the glass) and instead consider the changes in other dimensions too (such as the width of the glass). This allows for conservation to occur.



Figure 11.8 – Children looking at these glasses demonstrate decentration when looking at more than one attribute i.e. tall, short, and wide narrow. [13]

Identity: One feature of concrete operational thought is the understanding that objects have qualities that do not change even if the object is altered in some way. For instance, mass of an object does not change by rearranging it. A piece of chalk is still chalk even when the piece is broken in two. [14]



Figure 11.9 – A broken egg is still an egg. [15]



Figure 11.10 – A deflated balloon is still a balloon. [16]



Figure 11.11 – Broken chalk is still chalk. [17]

Transitivity: 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 boxer is a dog, then a boxer must be a mammal.[18]



Figure 11.12 – Transitivity allows children to understand that this boxer puppy, is a dog and a mammal. [19]

Looking at Piaget's Theory

Researchers have obtained findings indicating that cognitive development is considerably more continuous than Piaget claimed. Thus, the debate between those who emphasize discontinuous, stage-like changes in cognitive development and those who emphasize gradual continuous changes remains a lively one.[\[20\]](#)

Triarchic Theory of Intelligence

An alternative view of intelligence is presented by Sternberg (1997; 1999). Sternberg offers three types of intelligences. Sternberg provided background information about his view of intelligence in a conference, where he described his frustration as a committee member charged with selecting graduate students for a program in psychology. He was concerned that there was too much emphasis placed on aptitude test scores (we will discuss this later in the chapter) and believed that there were other, less easily measured, qualities necessary for success in a graduate program and in the world

of work. Aptitude test scores indicate the first type of intelligence-academic

1. **Analytical** (componential) sometimes described as academic: includes the ability to solve problems of logic, verbal comprehension, vocabulary, and spatial abilities.
2. **Creative** (experiential): the ability to apply newly found skills to novel situations
3. **Practical** (contextual): the ability to use common sense and to know what is called for in a situation. [\[21\]](#)

Analytical



Figure 11.1 – Reading supports analytical intelligence. [\[22\]](#)

Creative



Figure 11.14 – Building with shows creative intelligence. [23]

Practical



Figure 11.15 – Navigating social settings is practical intelligence [24]

HOWARD GARDNER'S 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 nine intelligences that can be differentiated from each other.



Figure 11.16 – Howard Gardner. [25]

Gardner contends that these are also forms of intelligence. A high IQ does not always ensure success in life or necessarily indicate that a person has common sense, good interpersonal skills, or other abilities important for success. Gardner investigated intelligences by focusing on children who were talented in one or more areas. He identified these 9 intelligences based on other criteria including a set developmental history and psychometric findings.[\[26\]](#)

Howard Gardner (1983, 1998, 1999) suggests that there are not one, but nine domains of intelligence. The first three are skills that are measured by IQ tests:

Table 11.1 – Howard Gardner’s Multiple Intelligences[\[27\]](#)

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
Existential	The ability to understand and have concern from life’s larger questions, the meaning of life, and other spiritual matters

The concept of multiple intelligences has been influential in the field of education, and teachers have used these ideas to try to teach differently for individual 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 a sense of humor, artistic skills, dramatic skills, and so forth also separate intelligences?[\[28\]](#)

INFORMATION PROCESSING: LEARNING, MEMORY, AND PROBLEM SOLVING

During middle and late childhood children make strides in several areas of cognitive function including the capacity of working memory, their ability to pay attention, and their use of

memory strategies. Both changes in the brain and experience foster these abilities.

In this section, we will look at how children process information, think and learn, allowing them to increase their ability to learn and remember due to an improvement in the ways they attend to, store information, and problem solve.[\[29\]](#)

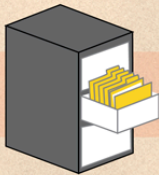
Working Memory: The capacity of working memory expands during middle and late childhood, research has suggested that both an increase in processing speed and the ability to inhibit irrelevant information from entering memory are contributing to the greater efficiency of working memory during this age (de Ribaupierre, 2002). Changes in **myelination** and **synaptic pruning** in the **cortex** are likely behind the increase in processing speed and ability to filter out irrelevant stimuli (Kail, McBride-Chang, Ferrer, Cho, & Shu, 2013).

Working Memory

The ability to temporarily hold and manipulate information for cognitive tasks performed in daily life.



Working memory holds information for a few seconds. It is temporary.



Working memory can hold only five to seven items at a time. It has a small capacity.



Working memory holds and manipulates information.



Working memory depends on control of attention and mental effort.

Figure 11.17 – Working memory expands during middle and late childhood. [30]

Attention: As noted above, the ability to inhibit irrelevant information improves during this age group, with there being a sharp improvement in selective attention from age six into adolescence (Vakil, Blachstein, Sheinman, & Greenstein, 2009). Children also improve in their ability to shift their attention

between tasks or different features of a task (Carlson, Zelazo, & Faja, 2013). A younger child who is asked to sort objects into piles based on type of object, car versus animal, or color of object, red versus blue, would likely have no trouble doing so. But if you ask them to switch from sorting based on type to now having them sort based on color, they would struggle because this requires them to suppress the prior sorting rule. An older child has less difficulty making the switch, meaning there is greater flexibility in their intentional skills. These changes in attention and working memory contribute to children having more strategic approaches to challenging tasks. **Memory Strategies:** Bjorklund (2005) describes a developmental progression in the acquisition and use of memory strategies. Such strategies are often lacking in younger children, but increase in frequency as children progress through elementary school. Examples of memory strategies include rehearsing information you wish to recall, visualizing and organizing information, creating rhymes, such as “i” before “e” except after “c”, or inventing acronyms (mnemonic devices), such as “roygbiv” to remember the colors of the rainbow. Schneider, Kron-Sperl, and Hu’nnerkopf (2009) reported a steady increase in the use of memory strategies from ages six to ten in their longitudinal study. Moreover, by age ten many children were using two or more memory strategies to help them recall information. Schneider and colleagues found that there were considerable individual differences at each age in the use of strategies, and that children who utilized more strategies had better memory performance than their same aged peers.

COGNITIVE PROCESSES

As children enter school and learn more about the world, they develop more categories for concepts and learn more efficient strategies for storing and retrieving information. One significant reason is that they continue to have more experiences on which to tie new information. In other words,

their **knowledge base**, knowledge in particular areas that makes learning new information easier, expands (Berger, 2014).



Figure 11.18 – As children learn more about the world, their knowledge base grows. [31]

Metacognition: refers to the knowledge we have about our own thinking and our ability to use this awareness to regulate our own cognitive processes (Bruning, Schraw, Norby, & Ronning, 2004). Children in this developmental stage also have a better understanding of how well they are performing a task, and the level of difficulty of a task. As they become more realistic about their abilities, they can adapt studying strategies to meet those needs. Young children spend as much time on an unimportant aspect of a problem as they do on the main point, while older children start to learn to prioritize and gauge what is significant and what is not. As a result, they develop metacognition. **Critical thinking**, or a detailed examination of beliefs, courses of action, and evidence, involves teaching children how to think. The purpose of critical thinking is to evaluate information in ways that help us make informed decisions. Critical thinking involves better understanding a problem through gathering, evaluating, and selecting information, and also by considering many possible solutions. Ennis (1987) identified several skills useful in critical thinking. These include: Analyzing arguments, clarifying information, judging the credibility of a source, making value judgments,

and deciding on an action. Metacognition is essential to critical thinking because it allows us to reflect on the information as we make decisions. Children differ in their cognitive process and these differences predict both their readiness for school, academic performance, and testing in school. (Prebler, Krajewski, & Hasselhorn, 2013).[\[32\]](#)

INTELLIGENCE TESTING: THE WHAT, THE WHY, AND THE WHO

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 part of individual differences, 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.

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.

Once the standardization has been accomplished, we have a picture of the average abilities of people at different ages and can calculate a person’s **mental age**, which is the age at which a person is performing intellectually. If we compare the mental age of a person to the person’s chronological age, the result is the **Intelligence Quotient (IQ)**, a measure of intelligence that

is adjusted for age. A simple way to calculate IQ is by using the following formula:

$$\text{IQ} = \text{mental age} \div \text{chronological age} \times 100.$$

Thus a 10-year-old child who does as well as the average 10-year-old child has an IQ of 100 ($10 \div 10 \times 100$), whereas an 8-year-old child who does as well as the average 10-year-old child would have an IQ of 125 ($10 \div 8 \times 100$). 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 intelligence "ratio" or "quotient" provides a good description of the score's meaning.

The Flynn Effect

It is important that intelligence tests be standardized on a regular basis, because the overall level of intelligence in a population may change over time. The Flynn effect refers to the observation that scores on intelligence tests worldwide have increased substantially over the past decades (Flynn, 1999). Although the increase varies somewhat from country to country, the average increase is about 3 IQ points every 10 years. There are many explanations for the Flynn effect, including better nutrition, increased access to information, and more familiarity with multiple-choice tests (Neisser, 1998). But whether people are actually getting smarter is debatable (Neisser, 1997). [33]

The Value of IQ Testing

The value of IQ testing is most evident in educational or clinical settings. Children who seem to be experiencing learning difficulties or severe behavioral problems can be tested to ascertain whether the child's difficulties can be partly attributed to an IQ score that is significantly different from the mean for her age group. Without IQ testing—or another measure of intelligence—children and adults needing extra

support might not be identified effectively. People also use IQ testing results to seek disability benefits from the Social Security Administration.

While IQ tests have sometimes been used as arguments in support of insidious purposes, such as the **eugenics movement**, which was the science of improving a human population by controlled breeding to increase desirable heritable characteristics. However, the value of this test is important to help those in need.[\[34\]](#)

Intelligence Tests and Those Who Created Them

Alfred Binet & Théodore Simon – Stanford- Binet Intelligence Test

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.

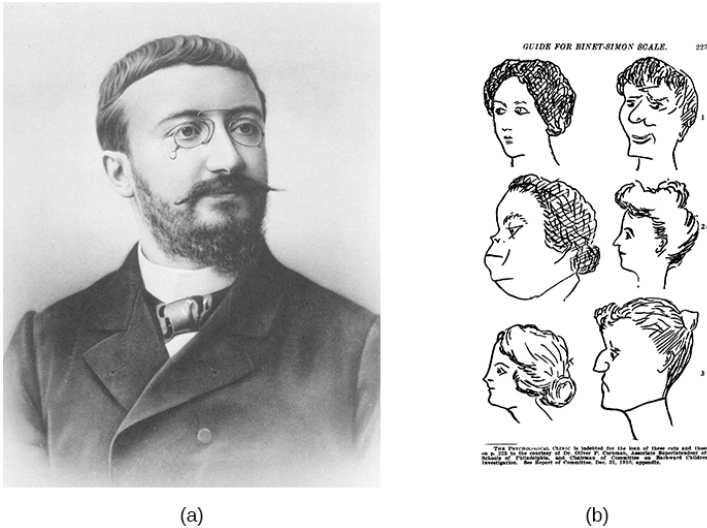


Figure 11.19 (a) Alfred Binet (b) This page is from a 1908 version of the Binet-Simon Intelligence Scale. Children being tested were asked which face, of each pair, was prettier. [35]

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. [36]

David Wechsler- Wechsler-Bellevue Intelligence Scale

In 1939, David Wechsler, a psychologist who spent part of his career working with World War I veterans, developed a new IQ test in the United States. Wechsler combined several subtests from other intelligence tests used between 1880 and World War I. These subtests tapped into a variety of verbal and nonverbal skills, because Wechsler believed that intelligence encompassed “the global capacity of a person to act purposefully, to think rationally, and to deal effectively with

his environment” (Wechsler, 1958, p. 7). He named the test the **Wechsler-Bellevue Intelligence Scale** (Wechsler, 1981). This combination of subtests became one of the most extensively used intelligence tests in the history of psychology.



Figure 11.20 – David Wechsler [37]

Today, there are three intelligence tests credited to Wechsler, the Wechsler Adult Intelligence Scale-fourth edition (WAIS-IV), the Wechsler Intelligence Scale for Children (WISC-V), and the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-III) (Wechsler, 2002). These tests are used widely in schools and communities throughout the United States, and they are periodically normed and standardized as a means of recalibration.

Bias of IQ Testing

Intelligence tests and psychological definitions of intelligence have been heavily criticized since the 1970s for being biased in favor of Anglo-American, middle-class respondents and for being inadequate tools for measuring non-academic types of intelligence or talent. Intelligence changes with experience, and intelligence quotients or scores do not reflect that ability to change. What is considered smart varies culturally as well, and most intelligence tests do not take this variation into account. For example, in the West, being smart is associated with being

quick. A person who answers a question the fastest is seen as the smartest, but in some cultures being smart is associated with considering an idea thoroughly before giving an answer. A well- thought out, contemplative answer is the best answer.[38]

A Spectrum of Intellectual Development

The results of studies assessing the measurement of intelligence show that IQ is distributed in the population in the form of a **Normal Distribution (or bell curve)**, which is the pattern of scores usually observed in a variable that clusters around its average. In a normal distribution, the bulk of the scores fall toward the middle, with many fewer scores falling at the extremes. The normal distribution of intelligence shows that on IQ tests, as well as on most other measures, the majority of people cluster around the average (in this case, where IQ = 100), and fewer are either very smart or very dull (see below).

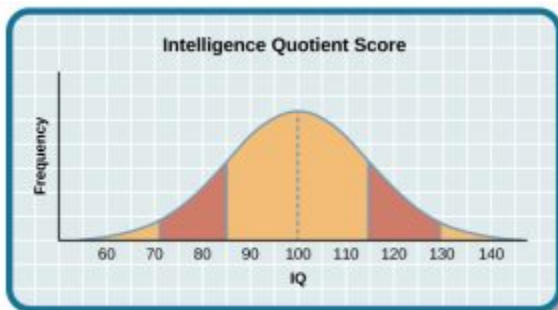


Figure 11.21 – The majority of people have an IQ score between 85 and 115. [39]

Distribution of IQ Scores in the General Population

This means that about 2% of people score above an IQ of 130, often considered the threshold for giftedness, and about the same percentage score below an IQ of 70, often being considered the threshold for an intellectual disability.

One end of the distribution of intelligence scores is defined by people with very low IQ. **Intellectual disability** (or **intellectual developmental disorder**) is assessed based on cognitive capacity (IQ) and adaptive functioning. The severity of the disability is based on adaptive functioning, or how well the person handles everyday life tasks. About 1% of the United States population, most of them males, fulfill the criteria for intellectual developmental disorder, but some children who are given this diagnosis lose the classification as they get older and better learn to function in society. A particular vulnerability of people with low IQ is that they may be taken advantage of by others, and this is an important aspect of the definition of intellectual developmental disorder (Greenspan, Loughlin, & Black, 2001).

One example of an intellectual developmental disorder is **Down syndrome**, a chromosomal disorder caused by the presence of all or part of an extra 21st chromosome. The incidence of Down syndrome is estimated at approximately 1 per 700 births, and the prevalence increases as the mother's age increases (CDC, 2014a). People with Down syndrome typically exhibit a distinctive pattern of physical features, including a flat nose, upwardly slanted eye, a protruding tongue, and a short neck.



Figure 11.22 – Down Syndrome is caused by the presence of all or part of an extra 21st chromosome. [40]

Fortunately, societal attitudes toward individuals with intellectual disabilities have changed over the past decades. We no longer use terms such as “retarded,” “moron,” “idiot,” or “imbecile” to describe people with intellectual differences, although these were the official psychological terms used to describe degrees of what was referred to as mental retardation in the past. Laws such as the Americans with Disabilities Act (ADA) have made it illegal to discriminate on the basis of mental and physical disability. The normal distribution of IQ scores in the general population shows that most people have about average intelligence, while very few have extremely high or extremely low intelligence. [41]

Giftedness

Being **gifted** refers to children who have an IQ of 130 or higher (Lally & Valentine-French, 2015). Having an extremely high IQ is clearly less of a problem than having an extremely low IQ but there may also be challenges to being particularly smart. It is often assumed that school children who are labeled as “gifted” may have adjustment problems that make it more difficult for them to create and maintain social relationships.

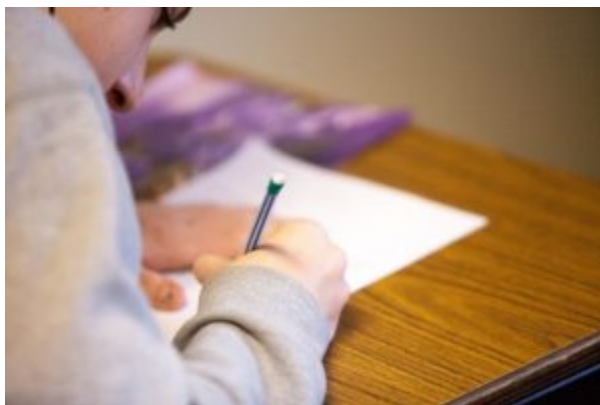


Figure 11.23 – Children who get a score on an intelligence test showing an IQ of 130 or higher are labeled as gifted. [42]

As you might expect based on our discussion of intelligence, there are also different types and areas of intelligence and giftedness. Some children are particularly good at math or science, some at automobile repair or carpentry, some at music or art, some at sports or leadership, and so on. There is a lively debate among scholars about whether it is appropriate or beneficial to label some children as “gifted and talented” in school and to provide them with accelerated special classes and other programs that are not available to everyone. Although doing so may help the gifted kids (Colangelo & Assouline, 2009), it also may isolate them from their peers and make such provisions unavailable to those who are not classified as “gifted.” Testing for high IQ or for disabilities needs to be critically looked at so that the good that these tests were created

for are not used for undesirable purposes.[43] How do we know so much about what children learn in schools? In the next section we'll look at the different types of tests and what the schools are testing.

Testing in Schools

Children's academic performance is often measured with the use of standardized tests. Those tests include, but are not limited to Achievement and Aptitude tests.



Figure 11.24 – Standardized tests are used to measure academic performance.[44]

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. **Aptitude tests** are designed to measure a student's ability to learn or to determine if a person has potential in a particular program. These are often used at the beginning of a course of study or as part of college entrance requirements. The Scholastic Aptitude Test (SAT) and Preliminary Scholastic Aptitude Test (PSAT) are perhaps the most familiar aptitude tests to students in grades 6 and

above. Learning test taking skills and preparing for SATs has become part of the training that some students in these grades receive as part of their pre-college preparation. Other aptitude tests include the MCAT (Medical College Admission Test), the LSAT (Law School Admission Test), and the GRE (Graduate Record Examination). Intelligence tests are also a form of aptitude test, which designed to measure a person's ability to learn.[\[45\]](#)

What Happened to No Child Left Behind?

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.



Figure 11.25 – The No Child Left Behind Act was signed into effect in 2001. [\[46\]](#)



Figure 11.26 – The Every Student Succeeds Act was signed into effect in 2015. [\[47\]](#)

On December 12, 2015 President Obama signed into law the **Every Student Succeeds Act** (ESSA). This law is state driven and focuses on expanding educational opportunities and improving student outcomes, including in the areas of high school graduation, drop-out rates, and college attendance. [\[48\]](#)

LANGUAGE DEVELOPMENT IN THE SCHOOL-AGE CHILD

Human language is the most complex behavior on the planet and, at least as far as we know, in the universe. Language involves both the ability to comprehend (receptive) spoken and written (expressive) words and to create communication in real time when we speak or write. Most languages are oral, generated through speaking. Speaking involves a variety of complex cognitive, social, and biological processes including operation of the vocal cords, and the coordination of breath with movements of the throat and mouth, and tongue. Other languages are sign languages, in which the communication is expressed by movements of the hands. The most common sign language is American Sign Language (ASL), currently spoken by more than 500,000 people in the United States alone.

Although language is often used for the transmission of information (“turn right at the next light and then go straight,” “Place tab A into slot B”), this is only its most mundane function. Language also allows us to access existing knowledge, to draw conclusions, to set and accomplish goals, and to understand and communicate complex social relationships. Language is fundamental to our ability to think, and without it we would be nowhere near as intelligent as we are.

Language can be conceptualized in terms of sounds, meaning, and the environmental factors that help us understand it. Phonemes are the elementary sounds of our language, morphemes are the smallest units of meaning in a language, syntax is the set of grammatical rules that control how words are put together, and contextual information is the elements of communication that are not part of the content of language but that help us understand its meaning. Understanding how language works means reaching across many branches of psychology—everything from basic **neurological** functioning to high-level **cognitive** processing. Language shapes our social

interactions and brings order to our lives. Complex language is one of the defining factors that make us human.[\[49\]](#)

INTRODUCTION TO LINGUISTICS

Language is such a special topic that there is an entire field, linguistics, devoted to its study. Linguistics views language in an objective way, using the **scientific method** and rigorous research to form **theories** about how humans acquire, use, and sometimes abuse language. There are a few major branches of linguistics, which it is useful to understand in order to learn about language from a psychological perspective.

Major Branches of Linguistics

This diagram outlines the various subfields of linguistics, the study of language. These include phonetics, phonology, morphology, syntax, semantics, and pragmatics.

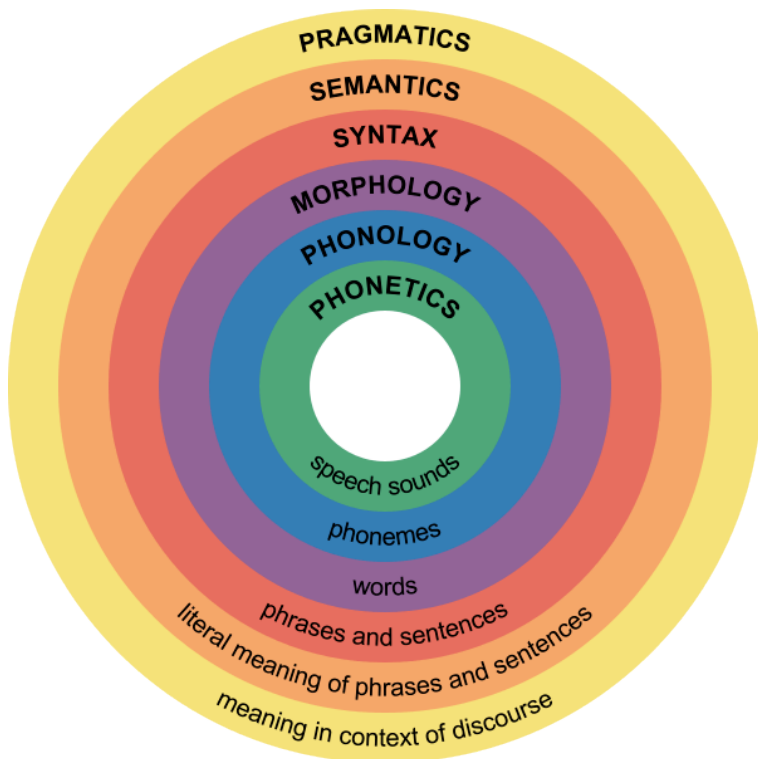


Figure 11.27 – Major branches of linguistics. [50]

Phonetics and Phonology

A **phoneme** is the smallest unit of sound that makes a meaningful difference in a language. The word “bit” has three phonemes, /b/, /i/, and /t/ (in transcription, phonemes are placed between slashes), and the word “pit” also has three: /p/, /i/, and /t/. 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. English contains about 45 phonemes.

Whereas phonemes are the smallest units of sound in language, **phonetics** is the study of individual speech sounds; **phonology** is the study of phonemes, which are the speech sounds of an individual language. These two heavily overlapping subfields cover all the sounds that humans can make, as well as which sounds make up different languages.

Morpheme and Morphology

A **morpheme** is a string of one or more phonemes *that* makes up the smallest units of meaning in a language. Some morphemes, such as one-letter words like “I” and “a,” are also phonemes, but most morphemes are made up of combinations of phonemes. 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.”

Morphology is the study of words and other meaningful units of language like suffixes and prefixes. A morphologist would be interested in the relationship between words like “dog” and “dogs” or “walk” and “walking,” and how people figure out the differences between those words.

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, while others do not.

Syntax is the study of sentences and phrases, or how people put words into the right order so that they can communicate meaningfully. All languages have underlying rules of syntax, which, along with morphological rules, make up every language’s grammar. An example of syntax coming into play in

language is “Eugene walked the dog” versus “The dog walked Eugene.” The order of words is not arbitrary—in order for the sentence to convey the intended meaning, the words must be in a certain order.[\[51\]](#)

Semantics and Pragmatics

Semantics, generally, is about the meaning of sentences. Someone who studies semantics is interested in words and what real-world object or concept those words denote, or point to.

Pragmatics is an even broader field that studies how the context of a sentence contributes to meaning. For example, someone shouting “Fire!” has a very different meaning if they are in charge of a seven-gun salute than it does if they are sitting in a crowded movie theater. Every language is different. In English, an adjective comes before a noun (“red house”), whereas in Spanish, the adjective comes after (“casa [house] roja [red].”) In German, you can put noun after noun together to form giant compound words; in Chinese, the pitch of your voice determines the meaning of your words. In American Sign Language, you can convey full, grammatical sentences with tense and aspect by moving your hands and face. But all languages have structural underpinnings that make them logical for the people who speak and understand them.[\[52\]](#)



Figure 11.28 – As speakers of Chinese, these boys would understand the importance of pitch. [53]

Cognitive Language and Communication

When learning one or more languages in middle childhood, children are able to understand that there are many complex parts including comprehension, fluency, and meaning when communicating. The following are areas of cognitive language and communication.

Lexicon

Every language has its rules, which act as a framework for meaningful communication. But what do people fill that framework up with? The answer is, of course, words. Every human language has a **lexicon**—the sum total of all of the words in that language. By using grammatical rules to combine words into logical sentences, humans can convey an infinite number of concepts.

Grammar

Because all language obeys a set of combinatory rules, we can communicate an infinite number of concepts. While every language has a different set of rules, all languages do obey rules. These rules are known as grammar. Speakers of a language

have internalized the rules and exceptions for that language's grammar. There are rules for every level of language—word formation (for example, native speakers of English have internalized the general rule that -ed is the ending for past-tense verbs, so even when they encounter a brand-new verb, they automatically know how to put it into past tense); phrase formation (for example, knowing that when you use the verb “buy,” it needs a subject and an object; “She buys” is wrong, but “She buys a gift” is okay); and sentence formation.

Older children are also able to learn new rules of grammar with more flexibility. While younger children are likely to be reluctant to give up saying “I goed there”, older children will learn this rather quickly along with other rules of grammar.

Vocabulary

One of the reasons that children can classify objects in so many ways is that they have acquired a vocabulary to do so. By fifth grade, a child's vocabulary has grown to 40,000 words. It grows at a rate that exceeds that of those in early childhood. This language explosion, however, differs from that of younger children because it is facilitated by being able to associate new words with those already known, and because it is accompanied by a more sophisticated understanding of the meanings of a word.

Context

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. Context is how everything within language works together to convey a particular meaning. Context includes tone of voice, body language, and the words being used. Depending on how a person says something, holds his or her body, or emphasizes certain points of a sentence, a variety of different messages can be conveyed. For example, the word “awesome,” when said

with a big smile, means the person is excited about a situation. “Awesome,” said with crossed arms, rolled eyes, and a sarcastic tone, means the person is not thrilled with the situation.[\[54\]](#)



Figure 11.29 – Context helps us understand meaning. [\[55\]](#)

New Understanding

Those in middle and late childhood are also able to think of objects in less literal ways. For example, if asked for the first word that comes to mind when one hears the word “pizza”, the younger child is likely to say “eat” or some word that describes what is done with a pizza. However, the older child is more likely to place pizza in the appropriate category and say “food”. This sophistication of vocabulary is also evidenced by the fact that older children tell jokes and delight in doing so. They may use jokes that involve plays on words such as “knock-knock” jokes or jokes with punch lines. Young children do not understand play on words and tell “jokes” that are literal or slapstick, such as “A man fell down in the mud! Isn’t that funny?”[\[56\]](#)

BILINGUALISM – ALSO KNOWN AS DUAL LANGUAGE LEARNERS OR ENGLISH LANGUAGE LEARNERS

Although **monolingual** speakers (those that only speak one language) often do not realize it, the majority of children around the world are **bilingual**, (they understand and use two languages). (Meyers- Sutton, 2005). Even in the United States, which is a relatively monolingual society, more than 47 million people speak a language other than English at home, and about 10 million of these people are children or youth in public schools (United States Department of Commerce, 2003). The large majority of bilingual students (75%) are Hispanic, but the rest represent more than a hundred different language groups from around the world. In larger communities throughout the United States, it is therefore common for a single classroom to contain students from several language backgrounds at once. In classrooms, as in other social settings, bilingualism exists in different forms and degrees.

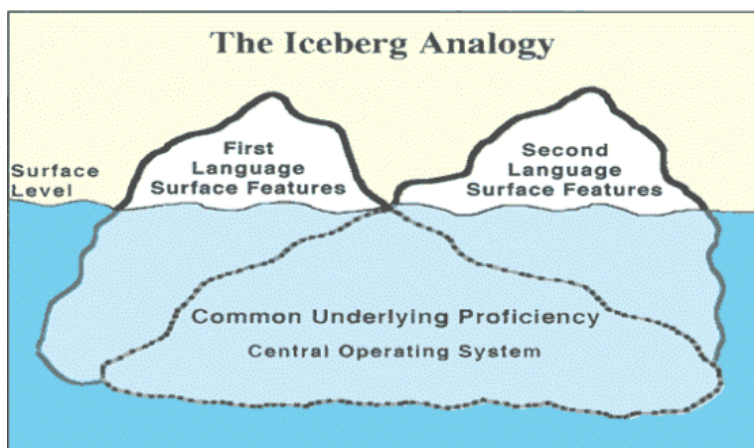


Figure 11.30 – The Iceberg Analogy. [57]

The student who speaks both languages fluently has a definite cognitive advantage. As you might suspect and research confirmed, a fully fluent bilingual student is in a better position

to express concepts or ideas in more than one way, and to be aware of doing so (Jimenez, Garcia,Pearson, 1995; Francis, 2006). 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).[\[58\]](#)

THEORIES OF LANGUAGE DEVELOPMENT

Humans, especially children, have an amazing ability to learn language. Within the first year of life, children will have learned many of the necessary concepts to have functional language, although it will still take years for their capabilities to develop fully. As we just explained, some people learn two or more languages fluently and are bilingual or multilingual. Here is a recap of the theorists and theories that have been proposed to explain the development of language, and related brain structures, in children.

Skinner: Operant Conditioning

B. F. Skinner believed that children learn language through **operant conditioning**; in other words, children receive “rewards” for using language in a functional manner. For example, a child learns to say the word “drink” when she is thirsty; she receives something to drink, which reinforces her use of the word for getting a drink, and thus she will continue to do so. This follows the four-term contingency that Skinner believed was the basis of language development—motivating operations, discriminative stimuli, response, and reinforcing stimuli. Skinner also suggested that children learn language through imitation of others, prompting, and shaping.

Chomsky: Language Acquisition Device

Noam Chomsky’s work discusses the biological basis for language and claims that children have innate abilities to learn language. Chomsky terms this innate ability the “language acquisition device.” He believes children instinctively learn

language without any formal instruction. He also believes children have a natural need to use language, and that in the absence of formal language children will develop a system of communication to meet their needs. He has observed that all children make the same type of language errors, regardless of the language they are taught. Chomsky also believes in the existence of a “universal grammar,” which posits that there are certain grammatical rules all human languages share. However, his research does not identify areas of the brain or a genetic basis that enables humans’ innate ability for language.

Piaget: Assimilation and Accommodation

Jean Piaget’s theory of language development suggests that children use both assimilation and accommodation to learn language. **Assimilation** is the process of changing one’s environment to place information into an already-existing schema (or idea). **Accommodation** is the process of changing one’s schema to adapt to the new environment. Piaget believed children need to first develop mentally before language acquisition can occur. According to him, children first create mental structures within the mind (schemas) and from these schemas, language development happens.

Vygotsky: Zone of Proximal Development

Lev Vygotsky’s theory of language development focused on social learning and **the zone of proximal development (ZPD)**. The ZPD is a level of development obtained when children engage in social interactions with others; it is the distance between a child’s *potential* to learn and the *actual learning* that takes place. Vygotsky’s theory also demonstrated that Piaget underestimated the importance of social interactions in the development of language.

Piaget’s and Vygotsky’s theories are often compared with each other, and both have been used successfully in the field of education.



Figure 11.31 – This park ranger is using the ZPD to increase these boys understanding. [59]

LEARNING TO READ

A huge milestone in middle childhood is learning to read and write. While the foundations of this were laid in infancy and early childhood, formal instruction on this process usually happens during the school-age years. There isn't always complete agreement on how children are best taught to read. The following approaches to teaching reading are separated by their methodology, but today, models of reading strive for a balance between the two types of reading methods because they are both recognized as essential for learning to read.

A **phonics-based approach** teaches reading by making sure children can understand letter-sound correspondences (how letters sound), automatically recognize familiar words, and decode unfamiliar words. This ability to break the code of reading allows children to read words they have never heard spoken before.

The **whole-language approach** attempts to teach reading as naturally as possible. As the sounds of words don't have meaning, the focus is on reading words and sentences in context (such as real books), rather than learning the sounds and phonemes that make up words.[\[60\]](#)

LEARNING DIFFICULTIES

When children don't seem to be developing or learning in the typical pattern one might be assessed for a disorder or disability. What is a learning disorder or disability? In the next section we'll learn about the spectrum of disorders and how they may impact many areas of the child's life.

- A **learning disorder** is a classification of disorders in which a person has difficulty learning in a typical manner within one of several domains. Types of learning disorders include difficulties in reading (dyslexia), mathematics (dyscalculia), and writing (dysgraphia). These disorders are diagnosed with certain criteria.
- A **learning disability** has problems in a specific area or with a specific task or type of activity related to education.

Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. In the Diagnostic and Statistical Manual of Mental Disorders -DSM-5, a qualified person will make a diagnosis, identified causes, and will make a treatment plan for disorders and disabilities. The diagnosis of specific learning disorder was added to the DSM-5 in 2013.

The DSM does not require that a single domain of difficulty (such as reading, mathematics, or written expression) be identified—instead, it is a single diagnosis that describes a collection of potential difficulties with general academic skills,

simply including detailed specifics for the areas of reading, mathematics, and writing. Academic performance must be below average in at least one of these fields, and the symptoms may also interfere with daily life or work. In addition, the learning difficulties cannot be attributed to other sensory, motor, developmental, or neurological disorders.[\[61\]](#)

The following is an example of the DSM-5 – learning disorders.

Learning Disorders:

- Dyslexia – Reading
- Dyscalculia – Mathematics
- Dyspraxia – Motor Coordination
- Dysgraphia – Writing
- Auditory Processing Disorder – Hearing
- Visual Processing Disorder – Visual

Speech and Language Disorders:

- Aphasia – Loss of language – expressive and receptive
- Articulation Disorder – An articulation disorder
- Fluency Disorders – Fluency disorders
- Voice Disorders – Disorders of the voice[\[62\]](#)

Learning Disorders or Disabilities

Dyslexia

Dyslexia, sometimes called “reading disorder,” is the most common learning disability; of all students with specific learning disabilities, 70%–80% have deficits in reading. The term “developmental dyslexia” is often used as a catchall term, but researchers assert that dyslexia is just one of several types of reading disabilities. A reading disability can affect any part

of the reading process, including word recognition, word decoding, reading speed, prosody (oral reading with expression), and reading comprehension.

Dyscalculia

Dyscalculia is a form of math-related disability that involves difficulties with learning math-related concepts (such as quantity, place value, and time), memorizing math-related facts, organizing numbers, and understanding how problems are organized on the page. Dyscalculics are often referred to as having poor “number sense.”

Dyspraxia

Children who have motor skills substantially below what is expected for their age are diagnosed with **dyspraxia** – or developmental coordination disorder (DCD) as it is more formally known. They are not lazy, clumsy or unintelligent – in fact, their intellectual ability is in line with the general population – but they do struggle with everyday tasks that require coordination.



Figure 11.32 – Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. [63]

Dysgraphia

The term **dysgraphia** is often used as an overarching term for all disorders of written expression. Individuals with dysgraphia typically show multiple writing-related deficiencies, such as grammatical and punctuation errors within sentences, poor paragraph organization, multiple spelling errors, and excessively poor penmanship.[\[64\]](#)

Auditory Processing Disorder

A processing deficit in the auditory modality that spans multiple processes is **auditory processing disorder** (APD). To date, APD diagnosis is mostly based on the utilization of speech material. Unfortunately, acceptable non-speech tests that allow differentiation between an actual central hearing disorder and related disorders such as specific language impairments are still not adequately available.

Visual Processing Disorder

Difficulty processing or interpreting visual information is referred to as **visual processing disorder** (VPD). Kids with visual processing issues may have difficulty telling the difference between two shapes or finding a specific piece of information on a page.[\[65\]](#)

Table 11.2 – Summary of Learning Disabilities[66]

Disability	Difficulties	Effects
Dyslexia	Difficulty with reading	Problems reading, writing, spelling
Dyscalculia	Difficulty with math	Problems doing math problems, understanding time, using money
Dyspraxia (Sensory Integration Disorder)	Difficulty with fine motor skills	Problems with hand-eye coordination, balance manual dexterity
Dysgraphia	Difficulty with writing	Problems with handwriting, spelling, organizing ideas
Auditory Processing Disorder	Difficulty hearing difference between sounds	Problems with reading, comprehension, language
Visual Processing Disorder	Difficulty interpreting visual information	Problems with reading, math, maps, charts, symbols, pictures

Speech and Language Disorders

Aphasia

A loss of the ability to produce or understand language is referred to as **aphasia**. Without the brain, there would be no language. The human brain has a few areas that are specific to language processing and production. When these areas are damaged or injured, capabilities for speaking or understanding can be lost, a disorder known as aphasia. These areas must function together in order for a person to develop, use, and understand language.

Articulation disorder

An articulation disorder refers to the inability to correctly produce speech sounds (phonemes) because of imprecise placement, timing, pressure, speed, or flow of movement of the lips, tongue, or throat (NIDCD, 2016). Sounds can be substituted, left off, added or changed. These errors may make it hard for people to understand the speaker. They can range

from problems with specific sounds, such as lisping to severe impairment in the phonological system. Most children have problems pronouncing words early on while their speech is developing. However, by age three, at least half of what a child says should be understood by a stranger. By age five, a child's speech should be mostly intelligible. Parents should seek help if by age six the child is still having trouble producing certain sounds. It should be noted that accents are not articulation disorders (Medline Plus, 2016a).

Fluency disorders

Fluency disorders affect the rate of speech. Speech may be labored and slow, or too fast for listeners to follow. The most common fluency disorder is stuttering.

Stuttering is a speech disorder in which sounds, syllables, or words are repeated or last longer than normal. These problems cause a break in the flow of speech, which is called dysfluency (Medline Plus, 2016b). About 5% of young children, aged two-five, will develop some stuttering that may last from several weeks to several years (Medline Plus, 2016c). Approximately 75% of children recover from stuttering. For the remaining 25%, stuttering can persist as a lifelong communication disorder (National Institute on Deafness and other Communication Disorders, NIDCD, 2016). This is called developmental stuttering and is the most common form of stuttering.

Brain injury, and in very rare instances, emotional trauma may be other triggers for developing problems with stuttering. In most cases of developmental stuttering, other family members share the same communication disorder. Researchers have recently identified variants in four genes that are more commonly found in those who stutter (NIDCD, 2016).

Voice disorders

Disorders of the voice involve problems with pitch, loudness, and quality of the voice (American Speech-Language and Hearing Association, 2016). It only becomes a disorder when problems with the voice make the child unintelligible. In children, voice disorders are significantly more prevalent in males than in females. Between 1.4% and 6% of children experience problems with the quality of their voice. Causes can be due to structural abnormalities in the vocal cords and/or larynx, functional factors, such as vocal fatigue from overuse, and in rarer cases psychological factors, such as chronic stress and anxiety.[67]



Figure 11.33 – Speech therapy. [68]

Children with Disabilities: Legislation

Since the 1970s political and social attitudes have moved increasingly toward including people with disabilities into a wide variety of “regular” activities. In the United States, the shift is illustrated clearly in the Federal legislation that was enacted during this time. Three major laws were passed that guaranteed the rights of persons with disabilities, and of

children and students with disabilities in particular. The third law has had the biggest impact on education.

The Rehabilitation Act of 1973, Section 504

This law, the first of its kind, required that individuals with disabilities be accommodated in any program or activity that receives Federal funding (PL93-112, 1973). Although this law was not intended specifically for education, in practice it has protected students' rights in some extra-curricular activities (for older students) and in some childcare or after-school care programs (for younger students). If those programs receive Federal funding of any kind, the programs are not allowed to exclude children or youths with disabilities, and they have to find reasonable ways to accommodate the individuals' disabilities.

Americans with Disabilities Act of 1990 (or ADA)

This legislation also prohibited discrimination on the basis of disability, just as Section 504 of the Rehabilitation Act had done (PL 101-336, 1990). Although the ADA also applies to all people (not just to students), its provisions are more specific and "stronger" than those of Section 504. In particular, ADA extends to all employment and jobs, not just those receiving Federal funding. It also specifically requires accommodations to be made in public facilities such as with buses, restrooms, and telephones. ADA legislation is therefore responsible for some of the "minor" renovations in schools that you may have noticed in recent years, like wheelchair-accessible doors, ramps, and restrooms, and public telephones with volume controls.



Figure 11.34 – President George H. W. Bush Signs the Americans with Disabilities Act, 07/26/1990. [69]

Individuals with Disabilities Education Act (or IDEA)

As its name implied this legislation was more focused on education than either Section 504 or ADA. It was first passed in 1975 and has been amended several times since, including most recently in 2004 (PL 108-446, 2004). In its current form, the law guarantees the following rights related to education for anyone with a disability from birth to age 21.

The first two rights influence schooling in general, but the last three affect the work of classroom teachers rather directly:

- **Free, appropriate education:** An individual or an individual's family should not have to pay for education simply because the individual has a disability, and the educational program should be truly educational; i.e., not merely caretaking or babysitting.
- **Due process:** In case of disagreements between an individual with a disability and the schools or other professionals, there must be procedures for resolving the disagreements that are fair and accessible to all

parties, including the person himself or herself or the person's representative.

- **Fair evaluation of performance in spite of disability:** Tests or other evaluations should not assume test taking skills that a person with a disability cannot reasonably be expected to have, such as holding a pencil, hearing or seeing questions, working quickly, or understanding and speaking orally. Evaluation procedures should be modified to allow for these differences. This provision of the law applies both to evaluations made by teachers and to school-wide or "high-stakes" testing programs.
- **Education in the "least restrictive environment":** Education for someone with a disability should provide as many educational opportunities and options for the person as possible, both in the short term and in the long term. In practice, this requirement has meant including students in regular classrooms and school activities as much as possible.
- **An Individualized Educational Plan (IEP):** Given that every disability is unique, instructional planning for a person with a disability should be unique or individualized as well. In practice, this provision has led to classroom teachers planning individualized programs jointly with other professionals (like reading specialists, psychologists, or medical personnel) as part of a team.[\[70\]](#)

Special Education Process



Figure 11.35 – The special education process. [71]

Conclusion

In this chapter we looked at:

- Piaget's concrete operational stage of cognitive development.
- Theories of intelligence.
- How children process information.
- Intelligence testing.
- The spectrum of intellectual abilities.
- Language and communication development.
- Learning difficulties.

In the next chapter, we will be examining school-aged children's developing understanding of themselves and the world around them and the widening influences on their social and emotional development.

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CHAPTER 12: SCHOOL-AGE CHILDREN - SOCIAL EMOTIONAL DEVELOPMENT

Chapter Objectives

After this chapter, you should be able to:

1. Describe the social emotional theories of development
2. Examine the importance of positive friendships and peer relationships
3. Describe self-understanding in childhood
4. Identify the types of families children are part of
5. Explain aggression, antisocial behavior, and bullying

INTRODUCTION

As children get older, their experiences allow them to develop a more realistic understanding of themselves, including both their strengths and weaknesses. This developing self-concept is influenced by messages they receive from their peers, their family, and the media.

SOCIAL EMOTIONAL THEORIES OF DEVELOPMENT

Erik Erikson- Industry vs. Inferiority

Erik Erikson proposed that we are motivated by a need to achieve competence in certain areas of our lives. As we've learned in previous chapters, Erikson's psychosocial theory has

eight stages of development over the lifespan, from infancy through late adulthood. At each stage there is a conflict, or task, that we need to resolve. Successful completion of each developmental task results in a sense of competence and a healthy personality. Failure to master these tasks leads to feelings of inadequacy.

During the elementary school stage (ages 6-12), children face the task of *Industry versus Inferiority*. Children begin to compare themselves to their peers to see how they measure up.



Figure 12.1 – The academic award this boy is receiving may contribute to his sense of industry. [1]

They either develop a sense of pride and accomplishment in their schoolwork, sports, social activities, and family life, or they feel inferior and inadequate when they don't measure up.[\[2\]](#)

According to Erikson, children in school-age children are very busy or industrious. They are constantly doing, planning, playing, getting together with friends, achieving. This is a very active time and a time when they are gaining a sense of how they measure up when compared with friends. Erikson

believed that if these industrious children can be successful in their endeavors, they will get a sense of confidence for future challenges. If not, a sense of inferiority can be particularly haunting during middle childhood.[3]

Sigmund Freud – Psychoanalytic Theory

The psychoanalyst Sigmund Freud (1856–1939) focused on unconscious, biological forces that he felt shape individual personality. Freud (1933) thought that the personality consists of three parts: the id, the ego, and the superego. The id is the selfish part of the personality and consists of biological instincts that all babies have, including the need for food and, more generally, the demand for immediate gratification. As babies get older, they learn that not all their needs can be immediately satisfied and thus develop the ego, or the rational part of the personality. As children get older still, they internalize society's norms and values and thus begin to develop their superego, which represents society's conscience. If a child does not develop normally and the superego does not become strong enough, the individual is more at risk for being driven by the id to commit antisocial behavior.[4]



Figure 12.2 – Development of the superego helps children overcome their unconscious desire to behave antisocially. [5]

Lawrence 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 patterns, Kohlberg (1984) argued that we learn our moral values through active thinking and reasoning, and that moral development follows a series of stages. Kohlberg's six stages are generally organized into three levels of moral reasons. To study moral development, Kohlberg looked at how children (and adults) respond to moral dilemmas. One of Kohlberg's best known moral dilemmas is the Heinz dilemma:

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make but the druggist was charging ten times what the drug cost him to make. He paid \$200 for the radium and charged \$2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money but he could only get together about \$1,000, about half of what the drug cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said: "No, I discovered the drug and I'm going to make money from it." Heinz got desperate and broke into the man's store to steal the drug for his wife. Should the husband have done that? (Kohlberg, 1969, p. 379)[\[6\]](#)

Level One – Pre-conventional Morality

In stage one; 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. In the second

stage, the child bases his or her thinking on self-interest and reward (“You scratch my back, I’ll scratch yours”). The youngest subjects seemed to answer based on what would happen to the man as a result of the act. For example, they might say the man should not break into the pharmacy because the pharmacist might find him and beat him. Or 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 **pre-conventional morality**. Pre-conventional 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 Two – Conventional Morality

Those tested who based their answers 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, 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 three, the person wants to please others. At stage four, 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.

NOTE: Level Three, post conventional morality, is not included here because it focuses on adolescence and adulthood.
Preconventional Morality (young children)

Stage	Description
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, most adults)

Stage	Description
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.

Post Conventional Morality (rare in adolescents, a few adults)

Table 12.1 – Lawrence Kohlberg’s Levels of Moral Reasoning

Stage	Description
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.

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 may describe the moral development of males better than it describes that of females (Jaffee & Hyde, 2000).^[7]

SELF-UNDERSTANDING

Children in school-age children have a more realistic sense of self than do those in early childhood. That exaggerated sense of self as “biggest” or “smartest” or “tallest” gives way to an understanding of one's strengths and weaknesses. This can be attributed to greater experience in comparing one's own performance with that of others and to greater cognitive flexibility. A child's self-concept can be influenced by peers and family and the messages they send about a child's worth. Contemporary children also receive messages from the media about how they should look and act. Movies, music videos, the internet, and advertisers can all create cultural images of what is desirable or undesirable and this too can influence a child's self-concept.



Figure 12.3 – Interactions with the media children's perception of themselves. [8]

Remarkably, young children begin developing social understanding very early in life and are also able to include other peoples' appraisals of them into their self-concept, including parents, teachers, peers, culture, and media. Internalizing others' appraisals and creating social comparison affect children's **self-esteem**, which is defined as an evaluation of one's identity. Children can have individual assessments of how well they perform a variety of activities and also develop an overall, global self-assessment. If there is a discrepancy between how children view themselves and what they consider to be their ideal selves, their self-esteem can be negatively affected.[9]**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. 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 optimal level seems to be either at, or slightly above, true ability.[\[10\]](#)



Figure 12.4 - Families can support children's social and emotional skills. [\[11\]](#)

As we have seen, children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people (leading, for example, to secure or insecure attachments to parents), understanding of how to interact with adults and peers, and self-concept based on how others respond to them. These relationships are also significant forums for emotional development.[\[12\]](#)

MOTIVATION AS SELF-EFFICACY

In addition to being influenced by their goals, interests, and attributions, students' motives are affected by specific beliefs about the student's personal capacities. In **self-efficacy theory** the beliefs become a primary, explicit explanation for motivation (Bandura, 1977, 1986, 1997). **Self-efficacy** is the belief that you are capable of carrying out a specific task or of reaching a specific goal. As mentioned previously, the optimal

level seems to be either at or slightly above true capacity (Bandura, 1997). As we indicate below, large discrepancies between self-efficacy and ability can create motivational problems for the individual.[\[13\]](#)

Motivation

Motivation refers to a desire, need, or drive that contributes to and explains behavioral changes. In general, motivators provide some sort of incentive for completing a task. One definition of a motivator explains it as a force “acting either on or within a person to initiate behavior.” In addition to biological motives, motivations can be either intrinsic (arising from internal factors) or extrinsic (arising from external factors).

Extrinsic vs. Intrinsic Motivation

Intrinsically motivated behaviors are performed because of the sense of personal satisfaction that they bring. According to Deci (1971), these behaviors are defined as ones for which the reward is the satisfaction of performing the activity itself. Intrinsic motivation thus represents engagement in an activity for its own sake. For example, if comforting a friend makes a child feel good, they are intrinsically motivated to respond to their friend’s distress.

Extrinsically motivated behaviors, on the other hand, are performed in order to receive something from others or avoid certain negative outcomes. The extrinsic motivator is outside of, and acts on, the individual. Rewards—such as a sticker, or candy—are good examples of extrinsic motivators. Social and emotional incentives like praise and attention are also extrinsic motivators since they are bestowed on the individual by another person.



Figure 12.5 – A lollipop can be an extrinsic motivator. [14]

Learned Helplessness and Self-Efficacy

If a person's sense of self-efficacy is very low, he or she can develop **learned helplessness**, a perception of complete *lack* of control in mastering a task. The attitude is similar to depression, a pervasive feeling of apathy and a belief that effort makes no difference and does not lead to success. Learned helplessness was originally studied from the behaviorist perspective of classical and operant conditioning by the psychologist Martin Seligman (1995). In people, learned helplessness leads to characteristic ways of dealing with problems. They tend to attribute the source of a problem to themselves, to generalize the problem to many aspects of life, and to see the problem as lasting or permanent. More optimistic individuals, in contrast, are more likely to attribute a problem to outside sources, to see it as specific to a particular situation or activity, and to see it as temporary or time-limited.

Consider, for example, two students who each fail a test. The one with a lot of learned helplessness is more likely to explain the failure by saying something like: “I’m stupid; I never perform well on any schoolwork, and I never will perform well at it.” The other, more optimistic student is more likely to say something like: “The teacher made the test too hard this time, so the test doesn’t prove anything about how I will do next time or in other subjects.”



Figure 12.6 – If this girl thinks that studying won’t help her do well on the test, her low self-efficacy may develop into learned helplessness.
[15]

What is noteworthy about these differences in perception is how much the more optimistic of these perspectives resembles high self-efficacy and how much learned helplessness seems to contradict or differ from it. As already noted, high self-efficacy is a strong belief in one’s capacity to carry out a *specific* task successfully. By definition, therefore, self-efficacy focuses attention on a temporary or time-limited activity (the task), even though the cause of successful completion (oneself) is “internal.”[16]

GENDER IDENTITY

The development of gender and gender identity is likewise an interaction among social, biological, and representational influences (Ruble, Martin, & Berenbaum, 2006). Young children learn about gender from parents, peers, and others in society, and develop their own conceptions of the attributes associated with maleness or femaleness (called **gender schemas**). They also negotiate biological transitions (such as puberty) that cause their sense of themselves and their sexual identity to mature.



Figure 12.7 – Social influences such as cultural norms impact children's interests, dress, style of speech and even life aspirations.
[17]

Each of these examples of the growth of social and emotional competence illustrates not only the interaction of social, biological, and representational influences, but also how their development unfolds over an extended period. Early influences are important, but not determinative, because the capabilities required for mature moral conduct, gender identity, and other

outcomes continue to develop throughout childhood, adolescence, and even the adult years. As the preceding sentence suggests, social and personality development continues through adolescence and the adult years, and it is influenced by the same constellation of social, biological, and representational influences discussed for childhood. Changing social relationships and roles, biological maturation and (much later) decline, and how the individual represents both experience and the self continue to form the bases for development throughout life. In this respect, when an adult looks forward rather than retrospectively to ask, “What kind of person am I becoming?”—A similarly fascinating, complex, multifaceted interaction of developmental processes lies ahead.[\[18\]](#)

CHILD AND THE FAMILY

The reason we turn out much like our parents, for better or worse, is that our families are such an important part of our socialization process. When we are born, our primary caregivers are almost always one or both of our parents. For several years we have more contact with them than with any other adults. Because this contact occurs in our most formative years, our parents’ interaction with us and the messages they teach us can have a profound impact throughout our lives. During middle childhood, children spend less time with parents and more time with peers. Parents may have to modify their approach to parenting to accommodate the child’s growing independence. Using reason and engaging in joint decision-making whenever possible may be the most effective approach (Berk, 2007).[\[19\]](#)



Figure 12.8 – When children grow up to love reading, may have been influenced by the positive experiences of being read to in their families. [20]

Family Atmosphere

One of the ways to assess the quality of family life is to consider the tasks of families. Berger (2005) lists five family functions:

1. Providing food, clothing and shelter
2. Encouraging learning
3. Developing self-esteem
4. Nurturing friendships with peers
5. Providing harmony and stability

Notice that in addition to providing food, shelter, and clothing, families are responsible for helping the child learn, relate to others, and have a confident sense of self. The family provides a harmonious and stable environment for living. A good home environment is one in which the child's physical, cognitive,

emotional, and social needs are adequately met. Sometimes families emphasize physical needs but ignore cognitive or emotional needs. Other times, families pay close attention to physical needs and academic requirement, but may fail to nurture the child's friendships with peers or guide the child toward developing healthy relationships. Parents might want to consider how it feels to live in the household. Is it stressful and conflict-ridden? Is it a place where family members enjoy being?[21]



Figure 12.8 – This mother is helping her son navigate using a tablet.
[22]

The Family Stress Model

Family relationships are significantly affected by conditions outside the home. For instance, the **Family Stress Model** describes how financial difficulties are associated with parents' depressed moods, which in turn lead to marital problems and poor parenting that contributes to poorer child adjustment (Conger, Conger, & Martin, 2010). Within the home, parental marital difficulty or divorce affects more than half the children growing up today in the United States. Divorce is typically associated with economic stresses for children and parents, the renegotiation of parent-child relationships (with one parent

typically as primary custodian and the other assuming a visiting relationship), and many other significant adjustments for children. Divorce is often regarded by children as a sad turning point in their lives, although for most it is not associated with long-term problems of adjustment (Emery, 1999).

Family Forms

As discussed previously in chapter 9, the sociology of the family examines the family as an institution and a unit of socialization. Sociological studies of the family look at demographic characteristics of the family members: family size, age, ethnicity and gender of its members, social class of the family, the economic level and mobility of the family, professions of its members, and the education levels of the family members.

Currently, one of the biggest issues that sociologists study are the changing roles of family members. Often, each member is restricted by the gender roles of the traditional family. These roles, such as the father as the breadwinner and the mother as the homemaker, are declining. Now, the mother is often the supplementary provider while retaining the responsibilities of child rearing. In this scenario, females' role in the labor force is "compatible with the demands of the traditional family." Sociology studies have examined the adaptation of males' role to caregiver as well as provider. The gender roles are becoming increasingly interwoven and various other family forms are becoming more common.

What Families Look Like

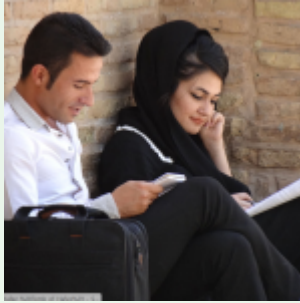


Figure 12.9 – A childless family. [23]



Figure 12.11 – An extended family. [25]



Figure 12.13 – A single parent (mother) family. [27]

Throughout this textbook and in the preceding images, you can see a variety of types of families. A few of these family types (the ones that are not bolded) were introduced in Chapter 9. Here is a list of some of the diverse types of families:

Families Without Children

Singlehood family contains a person who is not married or in a common law relationship. He or she may share a relationship with a partner but lead a single lifestyle.

Couples that are **childless** are often overlooked in the discussion of families.

Families with One Parent

A single parent family usually refers to a parent who has most of the day-to-day responsibilities in the raising of the child or children, who are not living with a spouse or partner, or who is not married. The dominant caregiver is the parent with whom the children reside for the majority of the time; if the parents are separated or divorced, children live with their custodial parent and have visitation with their noncustodial parent. In western society in general, following a separation a child will end up with the primary caregiver, usually the mother, and a secondary caregiver, usually the father.

Single parent by choice families refer to a family that a single person builds by choice. These families can be built with the use of assisted reproductive technology and donor gametes (sperm and/or egg) or embryos, surrogacy, foster or kinship care, and adoption.

Two Parent Families

The nuclear family is often referred to as the traditional family structure. It includes two married parents and children. While common in industrialized cultures (such as the U.S.), it is not actually the most common type of family worldwide.[\[29\]](#)

Cohabitation is an arrangement where two people who are not married live together in an intimate relationship, particularly an emotionally and/or sexually intimate one, on a long-term or permanent basis. Today, cohabitation is a common pattern among people in the Western world. More than two-thirds of married couples in the U.S. say that they lived together before getting married.

Gay and lesbian couples with children have same-sex families. While now recognized legally in the United States, discrimination against same-sex families is not uncommon. According to the American Academy of Pediatrics, there is “ample evidence to show that children raised by same-gender parents fare as well as those raised by heterosexual parents. More than 25 years of research have documented that there is no relationship between parents’ sexual orientation and any measure of a child’s emotional, psychosocial, and behavioral adjustment. Conscientious and nurturing adults, whether they are men or women, heterosexual or homosexual, can be excellent parents. The rights, benefits, and protections of civil marriage can further strengthen these families.”[\[30\]](#)

Blended families describe families with mixed parents: one or both parents remarried, bringing children of the former family into the new family[\[31\]](#). Blended families are complex in a number of ways that can pose unique challenges to those who seek to form successful stepfamily relationships (Visher & Visher, 1985). These families are also referred to as stepfamilies.

Families That Include Additional Adults

Extended families include three generations, grandparents, parents, and children. This is the most common type of family worldwide.[\[32\]](#)

Families by choice are relatively newly recognized. Popularized by the LGBTQ community to describe a family not recognized by the legal system. It may include adopted children, live-in partners, kin of each member of the household, and close friends. Increasingly family by choice is being practiced by those who see benefit to including people beyond blood relatives in their families.[\[33\]](#)

While most families in the U.S. are **monogamous**, some families have more than two married parents. These families are **polygamous**.[\[34\]](#) Polygamy is illegal in all 50 states, but it is legal in other parts of the world.[\[35\]](#)

Additional Forms of Families

Kinship families are those in which the full-time care, nurturing, and protection of a child is provided by relatives, members of their Tribe or clan, godparents, stepparents, or other adults who have a family relationship to a child. When children cannot be cared for by their parents, research finds benefits to kinship care.[\[36\]](#)

When a person assumes the parenting of another, usually a child, from that person's biological or legal parent or parents this creates **adoptive families**. Legal adoption permanently transfers all rights and responsibilities and is intended to affect a permanent change in status and as such requires societal recognition, either through legal or religious sanction. As introduced in Chapter 3, adoption can be done privately, through an agency, or through foster care and in the U.S. or from abroad. Adoptions can be closed (no contact with birth/biological families or open, with different degrees of contact with birth/biological families). Couples, both opposite and same-sex, and single parents can adopt (although not all agencies and foreign countries will work with unmarried, single, or same-sex intended parents).[\[37\]](#)

When parents are not of the same ethnicity, they build **interracial families**. Until the decision in *Loving v Virginia* in 1969, this was not legal in the U.S. There are other parts of the world where marrying someone outside of your race (or social class) has legal and social ramifications.^[38] These families may experience issues unique to each individual family's culture.

Changes in Families – Divorce

The tasks of families listed above are functions that can be fulfilled in a variety of family types—not just intact, two-parent households. Harmony and stability can be achieved in many family forms and when it is disrupted, either through divorce, or efforts to blend families, or any other circumstances, the child suffers (Hetherington & Kelly, 2002). Changes continue to happen, but for children they are especially vulnerable. Divorce and how it impacts children depends on how the caregivers handle the divorce as well as how they support the emotional needs of the child.



Figure 12.15 – How divorce impacts children largely depends on how parents handle it. [39]

Divorce

A lot of attention has been given to the impact of divorce on the life of children. The assumption has been that divorce has a strong, negative impact on the child and that single-parent families are deficient in some way. However, 75-80 percent of children and adults who experience divorce suffer no long-term effects (Hetherington & Kelly, 2002). An objective view of divorce, repartnering, and remarriage indicates that divorce, remarriage and life in stepfamilies can have a variety of effects.[\[40\]](#)

Factors Affecting the Impact of Divorce

As you look at the consequences (both pro and con) of divorce and remarriage on children, keep these family functions in mind. Some negative consequences are a result of financial hardship rather than divorce per se (Drexler, 2005). Some positive consequences reflect improvements in meeting these functions. For instance, we have learned that a positive self-esteem comes in part from a belief in the self and one's abilities rather than merely being complimented by others. In single-parent homes, children may be given more opportunity to discover their own abilities and gain independence that fosters self-esteem. If divorce leads to fighting between the parents and the child is included in these arguments, their self-esteem may suffer.

The impact of divorce on children depends on a number of factors. The degree of conflict prior to the divorce plays a role. If the divorce means a reduction in tensions, the child may feel relief. If the parents have kept their conflicts hidden, the announcement of a divorce can come as a shock and be met with enormous resentment. Another factor that has a great impact on the child concerns financial hardships they may suffer, especially if financial support is inadequate. Another difficult situation for children of divorce is the position they are

put into if the parents continue to argue and fight—especially if they bring the children into those arguments.

Short-term consequences: In roughly the first year following divorce, children may exhibit some of these short-term effects:

1. **Grief over losses suffered.** The child will grieve the loss of the parent they no longer see as frequently. The child may also grieve about other family members that are no longer available. Grief sometimes comes in the form of sadness but it can also be experienced as anger or withdrawal. Older children may feel depressed.
2. **Reduced Standard of Living.** Very often, divorce means a change in the amount of money coming into the household. Children experience new constraints on spending or entertainment. School-aged children, especially, may notice that they can no longer have toys, clothing or other items to which they've grown accustomed. Or it may mean that there is less eating out or being able to afford cable television, and so on. The custodial parent may experience stress at not being able to rely on child support payments or having the same level of income as before. This can affect decisions regarding healthcare, vacations, rents, mortgages and other expenditures. And the stress can result in less happiness and relaxation in the home. The parent who has to take on more work may also be less available to the children.
3. **Adjusting to Transitions.** Children may also have to adjust to other changes accompanying a divorce. The divorce might mean moving to a new home and changing schools or friends. It might mean leaving a neighborhood that has meant a lot to them as well.

Long-Term consequences: Here are some effects that go beyond just the first year following divorce.

1. **Economic/Occupational Status.** One of the most commonly cited long-term effects of divorce is that children of divorce may have lower levels of education or occupational status. This may be a consequence of lower income and resources for funding education rather than to divorce per se. In those households where economic hardship does not occur, there may be no impact on economic status (Drexler, 2005).
2. **Improved Relationships with the Custodial Parent** (usually the mother): Most children of divorce lead happy, well-adjusted lives and develop stronger, positive relationships with their custodial parent (Seccombe and Warner, 2004). Others have also found that relationships between mothers and children become closer and stronger (Guttman, 1993) and suggest that greater equality and less rigid parenting is beneficial after divorce (Steward, Copeland, Chester, Malley, and Barenbaum, 1997).
3. **Greater emotional independence in sons.** Drexler (2005) notes that sons who are raised by mothers only develop an emotional sensitivity to others that is beneficial in relationships.
4. **Feeling more anxious in their own love relationships.** Children of divorce may feel more anxious about their own relationships as adults. This may reflect a fear of divorce if things go wrong, or it may be a result of setting higher expectations for their own relationships.
5. **Adjustment of the custodial parent.** Furstenberg and Cherlin (1991) believe that the primary factor influencing the way that children adjust to divorce is the way the custodial parent adjusts to the divorce. If that parent is adjusting well, the children will benefit. This may explain a good deal of the variation we find in children of divorce.[\[41\]](#)



Figure 12.16 – Jeanette Wilinski is the mother of Elizabeth, Logan and Alexis. As a single mom, she has to find a balance between taking care of the Air Force mission and taking care of her children. [42]

Families are the most important part of the 6 to 11-year-old life. However, peers and friendships become more and more important to the child in middle childhood.

FRIENDSHIPS, PEERS, AND PEER GROUPS

Parent-child relationships are not the only significant relationships in a child's life. Friendships take on new importance as judges of one's worth, competence, and attractiveness. Friendships provide the opportunity for learning social skills such as how to communicate with others and how to negotiate differences. Children get ideas from one another about how to perform certain tasks, how to gain popularity, what to wear, say, and listen to, and how to act. This society of children marks a transition from a life focused on the family to a life concerned with peers. Peers play a key role in a child's self-esteem at this age as any parent who has tried to console a rejected child will tell you. No matter how complimentary and encouraging the parent may be, being rejected by friends can only be remedied by renewed acceptance.[43]



Figure 12.17 – Peers influence a child's self-esteem. [44]

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 to children's conceptualization of friendship[45].

Table 12.2 – Three Stages to Children's Conceptualization of Friendship[46]

Stage	Descriptions
Stage One	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	In 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 fifth graders emphasized this in a friend more than third or eighth graders.
Stage Three	In stage three, 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 more in a friend. They also found that as early as fifth grade, girls were starting to include the sharing of secrets and not betraying confidences as crucial to someone who is a friend.

Friendships are very important for children. The social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, &

Underwood, 2011). In these relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.[\[47\]](#)

Five Stages of Friendship from Early Childhood through Adulthood[\[48\]](#)

Selman (1980) outlines five stages of friendship from early childhood through to adulthood.

In stage 0, **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.

In stage 1, **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.

In stage 2, **fair-weather cooperation**, children are very concerned with fairness and reciprocity, and thus, *a friend is someone who 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.

In stage 3, **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 this 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.

In stage 4, **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

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior). With increasing age, children confront the challenges of bullying, peer victimization, and managing conformity pressures. Social comparison with peers is an important means by which children evaluate their skills, knowledge, and personal qualities, but it may cause them to feel that they do not measure up well against others. For example, a boy who is not athletic may feel unworthy of his football-playing peers and revert to shy behavior, isolating himself and avoiding conversation. Conversely, an athlete who doesn’t “get” Shakespeare may feel embarrassed and avoid reading altogether.



Figure 12.18 – Social comparison with peers is an important means by which children evaluate their value. [49]

Also, with the approach of adolescence, peer relationships become focused on psychological intimacy, involving personal disclosure, vulnerability, and loyalty (or its betrayal)—which significantly affect a child's outlook on the world. Each of these aspects of peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept.[\[50\]](#)

PEER RELATIONSHIPS

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 shy and withdrawn. The withdrawn-rejected children are easy targets for bullies because they are unlikely to retaliate when belittled (Boulton, 1999). Other rejected children 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.



Figure 12.19 – Peer relationships are particularly important for children. They can be supportive but also challenging. Peer rejection may lead to behavioral problems later in life. [51]

Peer Relationships are studied using **sociometric assessment** (which measures attraction between members of a group). 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 and do not like) is tabulated. Based on those tabulations, children are categorized into the following:

Table 12.3 – Categories in Peer Relationships[\[52\]](#)

Category	Description
Popular Children	Receive many votes in the “like” category, and very few in the “do not like” category.
Rejected children	Receive more unfavorable votes, and few favorable ones.
Controversial children	Mentioned frequently in each category, with several children liking them and several children placing them in the do not like category.
Neglected children	Rarely mentioned in either category.
Average children	Have a few positive votes with very few negative ones.
Popular-prosocial children	Are nice and have good social skills; 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.
Rejected-withdrawn children	Are shy and withdrawn and are easy targets for bullies because they are unlikely to retaliate when belittled.
Rejected-aggressive children	Are ostracized because they are aggressive, loud, and confrontational. They may be acting out of a feeling of insecurity.

Unfortunately for rejected children, 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).[\[53\]](#)

AGGRESSION, ANTISOCIAL BEHAVIOR, BULLIES, & VICTIMS

Aggression and Antisocial Behavior

Aggression may be physical or verbal/emotional. Aggression is activated in large part by the amygdala and regulated by the prefrontal cortex.



Figure 12.20 – This boy is threatening physical aggression. [54]

Testosterone is associated with increased aggression in both males and females. Aggression is also caused by negative experiences and emotions, including frustration, pain, and heat. As predicted by principles of observational learning, research evidence makes it very clear that, on average, people who watch violent behavior become more aggressive. Early, antisocial behavior leads to befriending others who also engage in antisocial behavior, which only perpetuates the downward cycle of aggression and wrongful acts.[\[55\]](#)

Bullying and Victims

According to Stopbullying.gov (2016), a federal government website managed by the U.S. Department of Health & Human Services, **bullying** is defined as unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance. Further, the aggressive behavior happens more than once or has the potential to be repeated. There are different types of bullying, including verbal bullying, which is

saying or writing mean things, teasing, name-calling, taunting, threatening, or making inappropriate sexual comments. Social bullying, also referred to as relational bullying, involves spreading rumors, purposefully excluding someone from a group, or embarrassing someone on purpose. Physical bullying involves hurting a person's body or possessions.

A more recent form of bullying is **cyberbullying**, which involves electronic technology. Examples of cyberbullying include sending mean text messages or emails, creating fake profiles, and posting embarrassing pictures, videos or rumors on social networking sites. Children who experience cyberbullying have a harder time getting away from the behavior because it can occur any time of day and without being in the presence of others (Stopbullying.gov, 2016).[\[56\]](#)

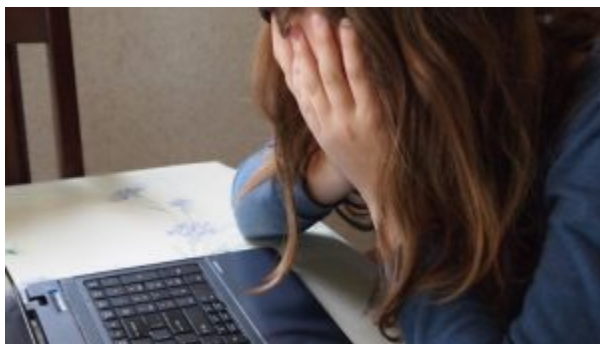


Figure 12.21 – Cyberbullying can be devastating for children. [\[57\]](#)

Those at Risk for Bullying

Bullying can happen to anyone but some students are at an increased risk for being bullied, including lesbian, gay, bisexual, transgendered (LGBT) youth, those with disabilities, and those who are socially isolated. Additionally, those who are perceived as different, weak, less popular, overweight, or having low self-esteem, have a higher likelihood of being bullied.

Those Who are More Likely to Bully

Bullies are often thought of as having low self-esteem, and then bully others to feel better about themselves. Although this can occur, many bullies in fact have high levels of self-esteem. They possess considerable popularity and social power and have well-connected peer relationships. They do not lack self-esteem, and instead lack empathy for others. They like to dominate or be in charge of others.

Bullied Children

Unfortunately, most children do not let adults know that they are being bullied. Some fear retaliation from the bully, while others are too embarrassed to ask for help. Those who are socially isolated may not know who to ask for help or believe that no one would care or assist them if they did ask for assistance. Consequently, it is important for parents and teachers to know the warning signs that may indicate a child is being bullied. These include: unexplainable injuries, lost or destroyed possessions, changes in eating or sleeping patterns, declining school grades, not wanting to go to school, loss of friends, decreased self-esteem and/or self-destructive behaviors.

Conclusion

In this chapter we looked at:

- Erikson's fourth stage of industry vs. inferiority
- Kohlberg's stages of moral development
- How school-age children continue to develop their self-understanding
- The role of the family and different forms of families
- Divorce and how it changes the family

- The importance of peers and friendships
- Children in peer groups and types of friendships
- Consequences of peer acceptance or rejection

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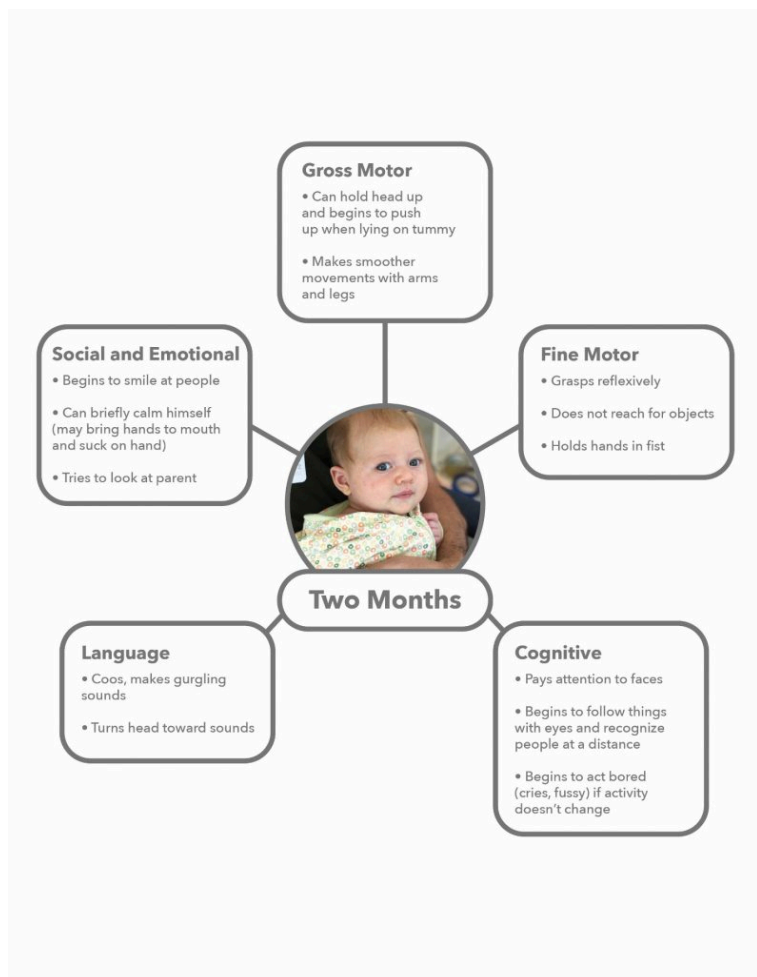
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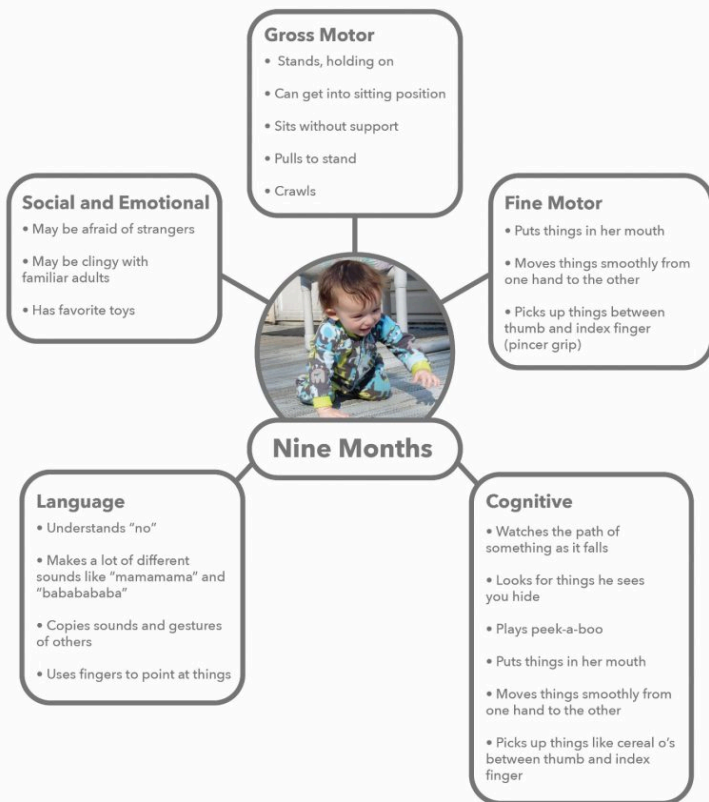
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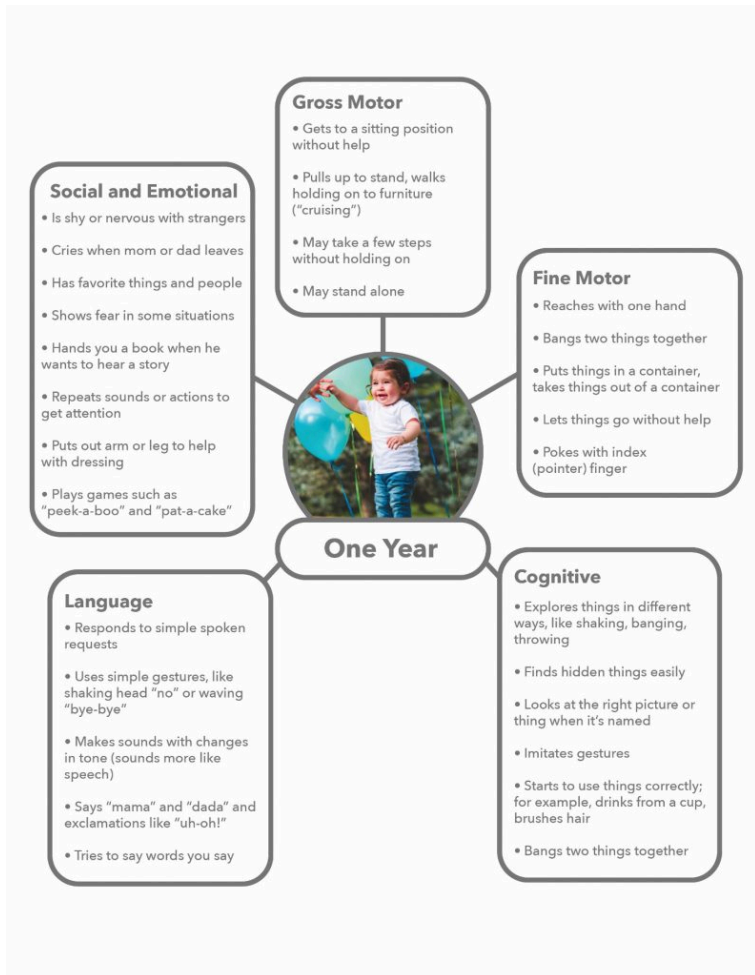
DEVELOPMENTAL MILESTONES





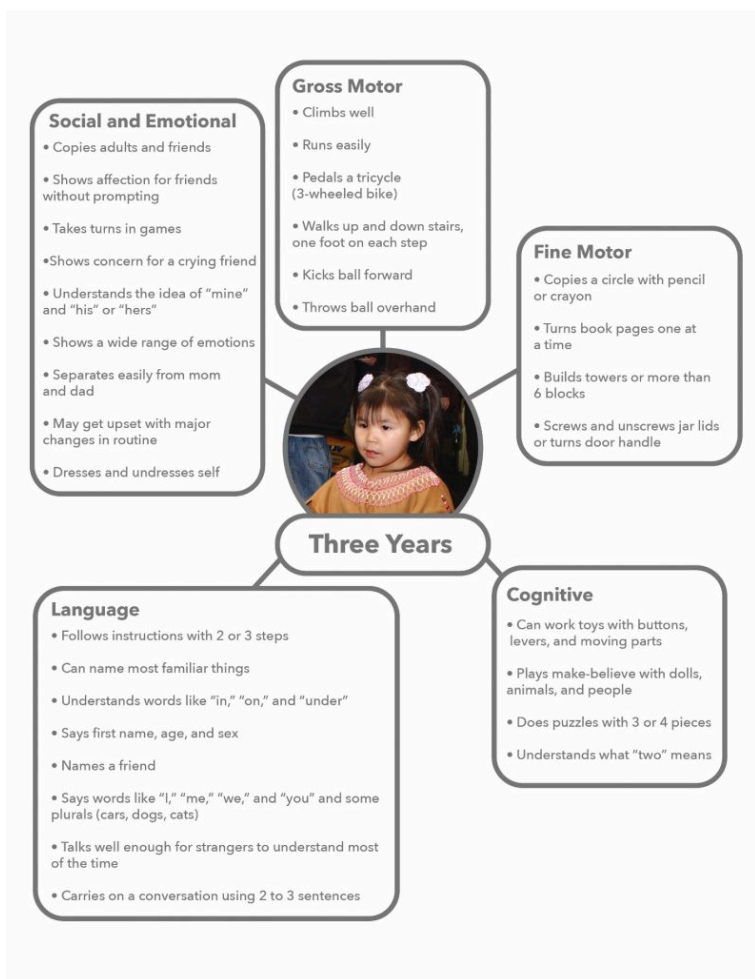






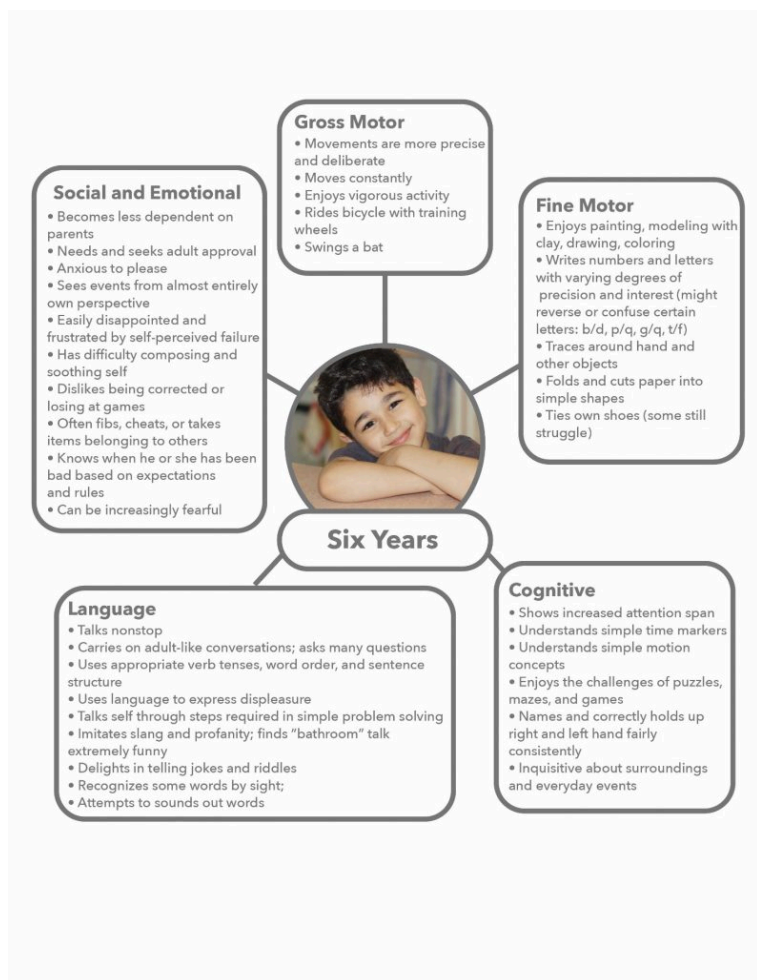


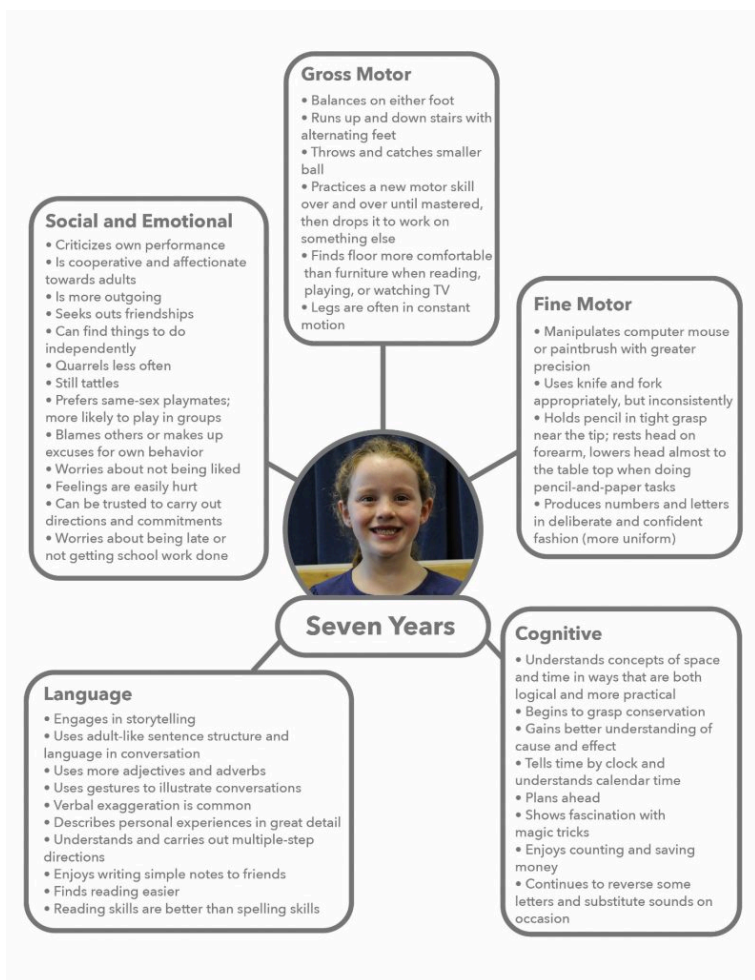














VERSIONING HISTORY

NSCC EDITION

MINNESOTA STATE EDITION

A Pressbooks edition was first published on Minnesota State Pressbooks, July 2020.

UNDERSTANDING THE WHOLE CHILD EDITION

Understanding the Whole Child is an adapted version of [Child Growth and Development](#) (2018) V1.2

- The title of the open textbook was changed from [Child Growth and Development](#) to Understanding the Whole Child
- A new cover was created.
- The title page and acknowledgements were adjusted.
- A new table of contents was created.
- Autonomy vs. shame and doubt was added to Chapter 6.