THE DEVELOPING CHILD



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Development of the Child: Birth through Age Eight

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1.4: About the Book

This textbook is a derivative of *Child, Growth and Development* by Paris, Ricardo, Raymond, & Johnson (College of the Canyons). Additional content was imported from *Observation, Assessment, and Participation in Early Childhood* by Studinka (2020). The combined work has been re-organized *and* expanded upon for more depth in an upper-level child development undergraduate course.

To make it easier to remix, all sections, in lieu of chapters, have learning objectives and include a reference list. For accessibility purposes, if images have a source url, it is linked via the Figure number to differentiate it between other images on the page rather than generically linking "Image" repeatedly.

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1.5: About the Author



Dr. Heather Carter worked with children and families, in many different roles, before transitioning to higher education in 2015. Dr. Carter enjoys sharing practical experiences from the public, private and government sectors to teach undergraduate and graduate students how growth and development intersect with different constructs that will impact their lives, personally and professionally.

Her educational background includes:

- Ed.D. from Tarleton State University (Stephenville, TX),
- M.S. in Human Development and Family Studies and B.S.E. in Childhood Education from the University of Arkansas (Fayetteville, AR).

Dr. Carter serves as a faculty mentor for Child Development undergraduate students, graduate student advisor for the M.S. in Career and Technical Education with a Family and Consumer Sciences emphasis, and teaches undergraduate and graduate coursework in the Family and Consumer Sciences Program within the department of Teaching and Leadership at Pittsburg State University in Pittsburg, KS. This is Dr. Carter's second OER textbook through LibreTexts. Her first is used with an introduction and overview of childhood programs course- *Exploring Early Childhood: Programs, Practices, and the Profession*.

1.6: Acknowledgements

First and foremost, I want to thank my editor, Dr. Amber Tankersley, for her tireless efforts to ensure quality and consistency throughout the text for our students. Without you, we would not be as close as we are to our to achieving our bigger vision. One more down!

To my husband- thank you for allowing me time to research, write, and edit during the evenings and on weekends. Your support in keeping our three boys busy so mom could work helped move this project along at an extraordinary pace. Thank you for always listening while I "talked shop" and help in sorting out ideas. You are an amazing human, and I'm so appreciative of you.

To my parents, who always inspired me to strive for great things and big goals.

To Alex, Ben, and Colton (my ABC boys)- this book is dedicated to you, your little minds, and all the wisdom you've imparted on me as your mom and as an early childhood professional. I love you more than words can describe.

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CHAPTER OVERVIEW

1: Issues and Themes in Child Development

1.1: Principles of Development
1.2: Periods of Development
1.3: Issues in Development
1.4: Contexts of Development
1.5: Being a Smart Consumer of Information About Development

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1.1: Principles of Development

Learning Objectives

1. Describe the five fundamental 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 losses 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 emotions, self-perception, and interpersonal relationships with families, peers, and friends.

All 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.

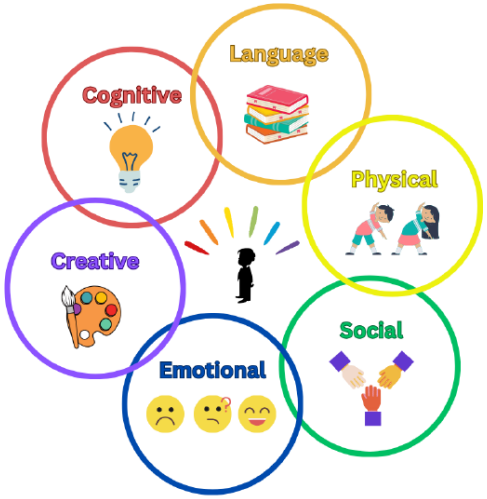


Figure 1.1.1. The developmental domains. Image by Heather Carter is licensed under CC BY-SA 4.0.

- 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**. We are influenced by both nature (genetics) and nurture (the environment). Where we live and our actions, beliefs, and values are a response to the 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.

References, Contributors, and Attributions

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3. Introduction to Lifespan, Growth and Development by Lumen Learning is licensed under CC BY 4.0

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1.2: Periods of Development

Learning Objectives

1. Identify and describe the major periods of development from infancy through middle childhood.
2. Briefly describe key characteristics of each developmental period.

Think about what periods or stages of development 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 who study development) break this part of the life span into these five stages as follows:

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

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

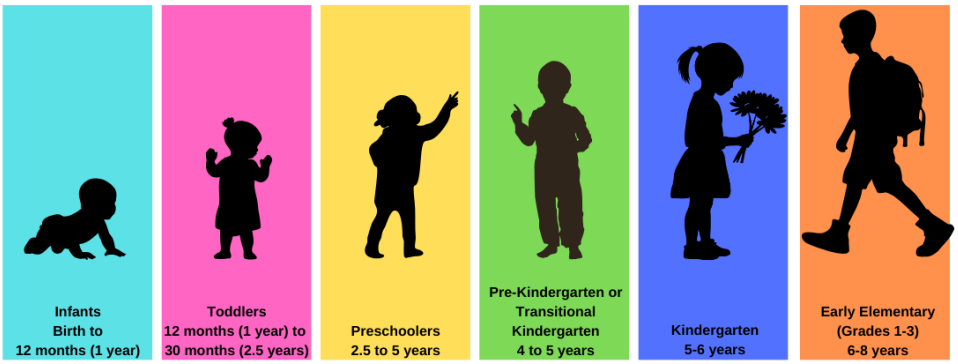


Figure 1.2.1: Ages and Stages from infancy to early elementary. Image by Amber Tankersley is licensed CC BY-SA 4.0.

Prenatal Development

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



Figure 1.2.2: A tiny embryo depicting some development of arms and legs, as well as facial features that are starting to show. Image by lunar caustic is licensed under CC BY 2.0.

Infancy and Toddlerhood

The first 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 1.2.3: A swaddled newborn. Image by Han Myo Htwe on Unsplash.

Early Childhood

Early childhood is also referred to as the preschool years and consists of the years that follow toddlerhood and precede formal schooling. As a child between three and five years old, they are busy learning language, gaining a sense of self and greater independence, and beginning to understand the workings of the physical world. This knowledge does not come quickly, however, and preschoolers may initially have interesting conceptions of size, time, space and distance such as fearing that they may go down the drain if they sit at the front of the bathtub or by demonstrating how long something will take by holding out their two index fingers several inches apart. A toddler's fierce determination to do something may give way to a four-year-old's sense of guilt for action that brings the disapproval of others.



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

Middle Childhood

The ages of six through eleven comprise middle childhood, and much of what children experience at this age is connected to their involvement in the early grades of school. Now the world becomes one of learning and testing new academic skills, and by assessing one's abilities and accomplishments by making comparisons between self and others. Schools compare students and make these comparisons public through team sports, test scores, and other forms of recognition. Growth rates slow down, and children are able to refine their motor skills at this point in life. Children begin to learn about social relationships beyond their family through interactions with friends and fellow students.



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

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1.3: Issues in Development

Learning Objectives

1. Identify and explain key issues in child development.
2. Evaluate the role of biological and environmental influences on shaping developmental outcomes.

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 engaged in the debate over "nature vs. nurture." 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 the most significant in shaping who 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 of nature or nurture alone.

Continuity versus Discontinuity

Is human development best characterized as a slow, gradual process, or is it best viewed as one of the more abrupt changes? The answer to that question often depends on which developmental theorist you ask and what topic is being studied. The theories of Freud, Erikson, Piaget, and Kohlberg are collectively known as 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 slower and gradual process known as continuous development. For instance, they would see the adult as not possessing new skills, but more advanced skills that were already present in some form in the child. Brain development and environmental experiences contribute to the acquisition of more developed skills.

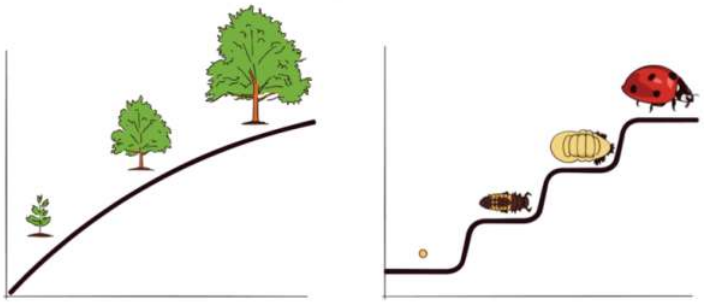


Figure 1.3.1: The graph to the left shows three stages in the continuous growth of a tree. The graph to the right shows four distinct stages of development in the life cycle of a ladybug. Image by NOBA is licensed under CC BY-NC-SA 4.0.

Active versus Passive

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

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

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1.4: Contexts of Development

Learning Objectives

1. Describe the various contexts that influence child development.
2. Explain how different environmental, cultural, and social factors interact to shape a child's growth and development.

The way development occurs varies widely depending on the context in which a child grows up. **Context**, in relation to development, refers to all the settings in which development occurs. Children develop in multiple contexts, including but not limited to:

- family,
- school,
- community,
- socio-economic status,
- and culture.

Family

The family is often considered the primary and most enduring context for child development. While families today take many different forms, they all serve one purpose: they are responsible for the socialization of the child (Levine & Munsch, 2024). "They [families] instill the norms, values, attitudes and beliefs of their culture so that children grow up to be positive, contributing members of their society" (Levine & Munsch, 2024, pg 16).



Figure **1.4.1**. A father walking with his two sons. Image by Heather Carter is licensed CC BY-NC-SA 4.0

School

School is another important context for development in most countries. In the United States, children spend approximately 30-35 hours a week in school. Within this context, children learn academic skills, such as reading, writing, and arithmetic, as well as providing additional socialization experiences. The quality of the school setting, including teacher support, peer relationships, and school resources, influences various developmental outcomes (Eccles & Roeser, 2011). Positive teacher-student relationships, for example, are linked to better academic performance and emotional well-being in students (Hamre & Pianta, 2001). Moreover, access to extracurricular activities can enhance children's socio-emotional development, helping them build resilience, social skills, and a sense of belonging (Mahoney et al., 2005).

Community

Communities offer both resources and challenges that impact child development. Children growing up in resource-rich communities with accessible parks, libraries, quality schools, and safe neighborhoods tend to have better cognitive and social

outcomes (Leventhal & Brooks-Gunn, 2000). Conversely, children in high-crime or impoverished neighborhoods face risks related to stress and limited access to quality education and healthcare.

Socioeconomic Status

Socioeconomic status (SES) is an indication of the perceived social standing, or social class, of an individual or group based on measures of income, education, and occupation (American Psychological Association, n.d.). Differences in socioeconomic status (SES) can be associated with inequities in access to resources, which in turn can have a negative impact on the lives of children and families. This process begins before a child is born, when parents without adequate resources have less access to good nutrition, quality prenatal care, or housing in environmentally safe areas.

Research shows that children from low-SES backgrounds often face challenges in terms of academic achievement, emotional regulation, and physical health (Bradley & Corwyn, 2002). SES impacts can begin in early childhood, where low-income families may experience limited access to quality childcare, nutrition, and healthcare (Duncan & Magnuson, 2011). However, programs like Head Start and interventions focused on family support can help alleviate some disadvantages and promote positive outcomes for children and families.

Culture

Culture includes the traditions, beliefs, values, and behaviors shared by a group (Arnett & Jensen, 2019). Culture emerges from a group's place in a particular environment, promoting the survival of the group by improving its ability to meet the environment's demands. In child development, parental ethnotheories are culturally engrained. Parental ethnotheories are a framework for understanding how a cultural context impacts development - in layman's terms, it's how culture influences the ideas parents have about the best way to raise their child.

While some developmental concepts are universal (such as play and love), many other aspects of development can vary greatly from one culture to another. Rather than labeling parenting practices as inferior or superior vs. different, we need to understand that these practices are a reflection of the cultural values held by the parents. When we respect this diversity, we are acknowledging that cultural context provides a sense of responsiveness to the "realities of a particular environment and promotes the well-being of children in that culture" (Levine & Munsch, 2024, p. 18).

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1.5: Being a Smart Consumer of Information About Development

Learning Objectives

1. Evaluate the credibility of sources.
2. Identify and avoid common misconceptions.
3. Apply evidence-based practices to make informed decisions about sources of information on child growth and development.

As students of child development, it is crucial to recognize that not all information is reliable and that not all sources are created equally. With a wealth of resources available—ranging from academic journals to social media posts—it is essential to develop skills in evaluating information critically. Being a smart consumer of developmental research involves knowing where information comes from, thinking critically about claims, recognizing biases, and avoiding overgeneralization. These skills will help ensure that the knowledge you gain is accurate, evidence-based, and applicable to real-world situations.



Figure 1.5.1. Focused young woman. Image by Liza Summer is licensed CC0.

Evaluating the Quality of Sources

Not all information about child development is backed by science. While some sources—such as peer-reviewed journal articles, government publications, and reports from reputable organizations—undergo rigorous review, others may be based on opinions or outdated research. When evaluating a source, ask yourself:

- **Who is the author?** Look for experts in child development, psychology, or education.
- **Is the source credible?** Reliable sources include universities, government agencies (e.g., the CDC or APA), and peer-reviewed journals.
- **Is the information recent?** Child development research evolves, so prioritize sources published in the last 5–10 years unless it is in reference to the original work (e.g., a theory, methodology, etc)
- **Does the source provide evidence?** Look for citations, references, or links to supporting research.

Key Tip: Avoid relying on personal blogs, social media posts, or articles without citations. If a source makes a strong claim but does not back it up with research, be skeptical (American Psychological Association [APA], 2020).

Thinking Critically About Information

Critical thinking means not taking information at face value. Instead of automatically accepting something as true, ask questions and look for evidence. A few key strategies include:

- **Check for bias:** Is the source trying to persuade rather than inform? Does it ignore opposing viewpoints?
- **Look at multiple sources:** A single study does not establish a fact—look for patterns across different studies.
- **Be cautious with correlations:** Just because two things happen together (e.g., increased screen time and lower test scores) does not mean one causes the other.

Key Tip: When reading research, pay attention to how the study was conducted. Well-designed studies use large, diverse samples and rigorous methods (Santrock, 2021).



Figure 1.5.2. Black, white and brown chess board game. Image is licensed CC0.

Avoiding Perceptual Bias

Our brains tend to seek out information that confirms what we already believe. This is called **confirmation bias**—the tendency to focus on evidence that supports our views while ignoring contradictory information. Another common bias is **availability bias**, where we assume something is more common or important because we can easily recall examples.

For example, if you've seen several social media posts about children developing autism after vaccinations, you might mistakenly believe there is a connection, even though extensive research has disproven this claim (Myers & Pineda, 2020).

Key Tip: Challenge yourself to read and consider perspectives that differ from your own. A well-rounded understanding of child development comes from analyzing multiple viewpoints, even those that challenge your beliefs.

Resist the Urge to Generalize

While research provides insights into patterns of child development, no single study applies to all children. Development is influenced by genetics, culture, environment, and individual differences. Consider the following:

- **Norms are not absolutes:** Milestones (like walking at 12 months) are general guidelines, but some children develop faster or slower.
- **Cultural differences matter:** Parenting styles, education, and daily routines vary widely across cultures, affecting developmental outcomes.
- **Children are individuals:** Even within the same family, siblings can develop at different rates.

Key Tip: When learning about developmental milestones, think in terms of ranges rather than fixed ages. Keep in mind that "normal" development looks different across cultures (Rogoff, 2016).

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CHAPTER OVERVIEW

2: Research and Ethics

2.1: The Scientific Method
2.2: Research Terminology
2.3: Research Methods
2.3.1: Qualitative Designs
2.3.2: Quantitative Designs
2.3.3: Mixed-Methods Designs
2.4: Ethics in Research
2.5: Relating Ethics to the Profession

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2.1: The Scientific Method

Learning Objectives

1. Describe the scientific method and its key steps in conducting research.
2. Identify common biases in personal inquiry and explain how the scientific method helps mitigate them.

An important part of learning any science is having a basic understanding of the techniques used to gather information. The hallmark of scientific investigation is 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 nutrition recommendations, in explanations of psychological states as people age, and in parenting advice. Think of learning about human development as a lifelong journey.

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

Paris in the the spring

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

Paris in the the spring

If you read it differently the second time (adding the second “the”), you just experienced one of the problems with personal inquiry; that is, the tendency to see what we believe. Our assumptions very often guide our perceptions. Consequently, when we believe something, we tend to see it even if it is not there. This problem may just be a result of cognitive ‘blinders’ or it may be part of a more conscious attempt to support our own views. Confirmation bias is the tendency to look for evidence that supports our position and, in doing so, we ignore contradictory evidence. Popper suggests that the distinction between what is scientific and what is unscientific is that science is falsifiable; scientific inquiry involves attempts to reject or refute a theory or set of assumptions (Thornton, 2005). A theory that cannot be falsified is not scientific. And much of what we do in personal inquiry involves drawing conclusions based on our personal experiences or validating our own experiences by discussing what we think is true with others who share the same views.

Science offers a more systematic way to make comparisons and guard against bias.

The Scientific Method

The scientific method is the process for understanding the world around us. The goal is to try to explain phenomena.

1. **Identify a question**: This can come from previous research, a theory, or an observation.
2. **Create a testable explanation (form a hypothesis):** A *hypothesis* is what one proposes as an explanation for a phenomenon, or in layman's terms, it's a researcher’s idea about a possible answer to a research question. Most social scientists formulate what are known as null hypotheses, or stating that there is *no* statistical significance between two (or more) variables. The reason for this is that it can be tested to determine whether a statistical relationship reflects a real relationship between the variables or if it is simply due to chance.
3. **Choose a design:** Based on what you're investigating and how the research question is worded, this will dictate the type of design, or methods, you will use to collect data for interpretation in answering your research questions. There are three main types of research methods that may be used: quantitative, qualitative, or mixed methods.
4. **Collecting data:** Based on the parameters of the research design (each has its own), the next step is to collect and analyze the data. For **qualitative methods**, the process involves organizing the data materials and coding for similar themes. For **quantitative data**, statistical analyses are run to determine if a relationship exists. Both types of methods can be analyzed using computer software programs.

5. **Draw conclusions:** Drawing conclusions refers to information that may be implied or inferred based on the results of the analyses. This means that the information is never clearly stated.

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.

Video	Video Description and Text Link
	The scientific method is a logical approach to understanding the world. It starts with an observation, followed by a question. A testable explanation or hypothesis is then created. An experiment is designed to test the hypothesis, and based on the results, the hypothesis is refined. This process is repeated, leading to a deeper understanding of the observed phenomenon. This method ensures our knowledge is built on a solid foundation. *The Scientific Method* was created by Sal Khan. Text link: https://www.khanacademy.org/science/...entific-method

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2.2: Research Terminology

Learning Objectives

1. Differentiate between quantitative, qualitative, and mixed-methods research approaches.
2. Identify and explain key research terminology, including: variables, scales of measurement, sampling, reliability, and validity.

Research terminology is unique and can be challenging to understand. Let's break down some of the most common vocabulary and concepts used across various research designs.

Research Methods

Simply put, research methods are the strategies, techniques, and processes used to collect, analyze, and interpret data with the end goal of answering a research question or testing a hypothesis.

Research methods are categorized in one of three ways.

1. **Quantitative**: methods focused on numerical data to identify patterns or relationships between variables.
2. **Qualitative:** methods focused on understanding the meanings, experiences, and perspectives of people.
3. **Mixed Methods:** include some combination of both qualitative and quantitative methods.

Variables

Variables are measurable characteristics that can be studied. There are four types of variables that could be used in various quantitative research methods:

1. **Independent (IV):** the variable(s) the research manipulates to observe its effect on the dependent variable.
2. **Dependent (DV):** the variable that is measured to see how it changes in response to the independent variable.
3. **Control:** variable(s) that are held constant throughout the study to minimize the influence on the dependent and/or independent variables.
4. **Confounding**: outside variable(s) that could influence the results. (There are various ways that a researcher could exclude or control, primarily through careful study design and specific techniques or statistical analyses.)

If having difficulty identifying the independent and dependent variable, use this saying: this affects that. For example, if we were to design a study to examine the relationship between regular soda and diet soda on blood sugar and apply "this affects that," we would identify the type of soda as the independent variable (IV) and blood sugar as the dependent variable (DV).

Scale of Measurement

Scale of measurement is a classification system used to categorize variables based on the type of information they provide (Stevens, 1946). There are four main scales, as noted in Table **2.2.1**. Each level of measurement scale has specific properties that determine the techniques used to display, summarize, and analyze the data. Therefore, knowing the level of measurement of your data is critically important.

Table **2.2.1**. Types of Scales of Measurement

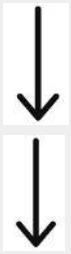
Order of Complexity	Scale of Measurement	This is....	This is what it looks like...
LOW	**Nominal**	Data that can only be organized into groups with no inherent order.	Gender, hair color, uniform numbers, city where you were born, etc.
	**Ordinal**	Data that can be ranked or ordered, but the distances between categories is not necessarily equal.	For example, let's say we observed a horse race. The order of finish is Rosebud #1, Sea Biscuit #2, and Kappa Gamma #3. We lack information about the difference in time or distance that separated the horses as they crossed the finish line.
	Interval	Data that can be ranked, the intervals between categories are equal, but there is no true zero point.	The classic example of the interval scale is temperature measured on the Fahrenheit or Celsius scales. Let's suppose today's high temperature is 60º F and thirty days ago the high temperature was only 30º F. We can say that the difference between the high temperatures on these two days is 30 degrees. But, because our measurement scale lacks a real, non-arbitrary zero, we cannot say the temperature today is twice as warm as the temperature thirty days ago.
HIGH	**Ratio**	Data that can be ranked, intervals are equal, and there is a true zero point.	An example of the ratio level of measurement is weight. A person who weighs 150 pounds weighs twice as much as a person who weighs only 75 pounds and half as much as a person who weighs 300 pounds. We can calculate ratios like these because the scale for weight in pounds starts at zero pounds.

Table **2.2.1** is adapted from Measurement & Measurement Scales by Volchok (2015) and licensed CC-BY-SA-SA.

Other Terms to Know

- **Sampling:** are methods used to select the group of participants in the study
- **Reliability:** is the consistency of measurements across different occasions. Meaning, if we take a survey today and retake it a month from now, will the survey questions yield similar answers the first time compared to when they are retaken? If the answer is yes, then it is considered a reliable measure.
- **Validity:** the accuracy of what is being measured.

- **Ecological validity:** refers to the realism with which a research design matches the real-world context. A great example of this is video games. A standard PS5 game and controller have less ecological validity compared to a Wii.

When studies are conducted, all of these concepts are essential to ensure the data has integrity. If a researcher is not using sampling methods appropriate to the population being studied, how can results be generalized? If an instrument used to collect data is not valid and reliable, how can results be replicated? When reading research, it's important to check if this information is being reported. If it's not, the study's quality should come into question.

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SECTION OVERVIEW

2.3: Research Methods

Learning Objectives

1. Compare different types of research methods based on their evidence of effectiveness.
2. Identify the strengths and weaknesses of various research designs, including: descriptive, correlational, quasi-experimental, experimental, and meta-analysis methods.

Types of Research Methods

Researchers often consider the evidence of effectiveness, in addition to the types of research questions being asked, when deciding on methods and the study design.

Evidence of effectiveness just refers to:

1. The rigor of the design (how strict the protocols are),
2. the generalizability of findings (does it apply to a specific population or a broad population), and
3. evidence of strength (higher-level research is considered more reliable and impactful).

Table **2.3.1** orders research methods based on evidence of effectiveness and moves from qualitative methods, quantitative methods, to mixed-methods.

Table **2.3.1**. Evidence of Effectiveness for Types of Research Methods.

Evidence of Effectiveness	Research Method	This is...
LOW	Descriptive- Qualitative (Ethnography/Case Study)	Detailed descriptions of specific situations using interviews, observations, and document review. You may describe things as they are.
↓	Descriptive- Quantitative	Numerical descriptions (frequency, average). You measure things as they are.
↓	Correlational/Regression Analyses	Quantitative analyses of the strength of relationships between two or more variables (e.g., are teacher qualifications correlated with student achievement?)
↓	Quasi-experimental	Comparing a group that receives a particular intervention with another group that is similar in characteristics but did not receive the intervention —no random assignment to group is used.
↓	Experimental	Using random assignment to assign participants to an experimental or treatment group and a control or comparison group (e.g., one receives the intervention and one does not)
HIGH	Meta-analysis	Synthesis of results from multiple studies to determine the average impact of a similar intervention across the studies.

Adapted from Edvantia SBR Rating for Technical Assistance Programs and Services form (2007) and Carter McNamara Overview of Methods to Collect Information handout.

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.

Topic hierarchy

2.3.1: Qualitative Designs

2.3.2: Quantitative Designs

2.3.3: Mixed-Methods Designs

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2.3.1: Qualitative Designs

Learning Objectives

1. Explain the purpose and key characteristics of qualitative research methods.
2. Differentiate between major qualitative methods, including interviews, observations, and case studies, and evaluate their strengths and limitations.
3. Identify ethical considerations and the role of researcher reflexivity in qualitative research.

Qualitative Methods

Qualitative methods seek to describe situations or phenomena. These types of designs often follow the following steps:

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 the study continues
6. Note patterns or consistencies.
7. Explore new areas deemed important by the people being observed.
8. Report findings. In qualitative research reporting, this is the only time it is acceptable to utilize first-person pronouns.

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, who inform the researcher about their world (Glazer & Strauss, 1967). Researchers should be aware of their own biases and assumptions, acknowledge them, and set them aside to prevent them from limiting the accuracy of their 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.

Interviews

Interviews are conversations between a researcher and a participant where the researcher, or interviewer, asks questions to gather information about the participant's experiences, opinions, or motivations. Interviews often provide rich data because this type of design allows for the asking of open-ended questions, such as *who, what, when, where, why, or how.* These questions allow the interviewer and interviewee to build a rapport and probe deeper to understand the phenomenon. Interviews, with consent, may also be recorded using audio and/or video, which allows the researcher the opportunity to review and conduct further analysis in the future, as well as observe body language in addition to just recording what an interviewee says.

The limitation of interviews is that they are time-consuming, both to conduct and analyze.



Figure 2.3.1.1: Interview conducting an interview on site to understand the interviewees thoughts and opinions. Image by Bernhard Amann is licensed CC BY-SA 4.0.

Observational Studies

Observational studies involve watching and recording the actions of participants. This may take place in a natural setting, such as observing children at play in a park, or behind one-way glass while they 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 researchers to see how people behave, rather than relying on self-reports. What people do and what they say they do are often very different. A significant 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 behave well.

Case Studies

Case studies involve exploring a single case or situation in great detail. Information can be gathered through 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. They are often used by clinicians who conduct case studies as part of their regular 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, because cases are not randomly selected and no control group is used for comparison.

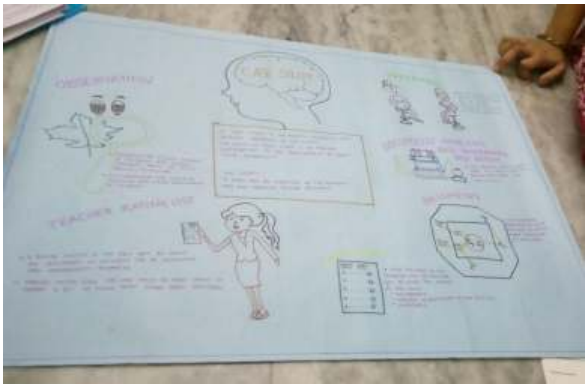


Figure 2.3.1.2: Illustrated poster from a classroom describing a case study. Image by MaryGeorge is licensed under CC BY-SA 4.0.

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2.3.2: Quantitative Designs

Quantitative Methods

Quantitative methods use research methods that rely on collecting and analyzing data using statistical techniques to understand phenomena, measure relationships between variables, and/or test hypotheses.

Surveys

Surveys are familiar to most people because they are so widely used. Surveys enhance accessibility to subjects because they can be conducted in person, over the phone, through the mail, or online. A survey involves asking a standard set of questions to a group of subjects. In a highly structured survey, subjects are forced to choose from a response set such as "strongly disagree, disagree, undecided, agree, strongly agree"; or "0, 1-5, 6-10, etc." This is known as the **Likert Scale**. Surveys are commonly used by sociologists, marketing researchers, political scientists, therapists, and others to gather information on many independent and dependent variables in a relatively short period of time. Surveys typically yield surface information on a wide variety of factors, but may not allow for in-depth understanding of human behavior.

Of course, surveys can be designed in various ways. They may include forced-choice questions and semi-structured questions, in which the researcher allows the respondent to describe or provide details about specific events. One of the most challenging 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! A lot of time and effort should be spent on constructing survey items. One of the benefits of having forced-choice items is that each response is coded, allowing results to be quickly entered and analyzed using statistical software. Analysis takes much longer when respondents provide lengthy responses that need to be analyzed in a different way. Surveys help examine 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, as well as in other areas. 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 2.3.2.1: A longitudinal research design. Image by NOBA is licensed under CC BY-NC-SA 4.0.

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

Cross-sectional Research

Cross-sectional research involves beginning with a sample that represents a cross-section of the population. Respondents who vary in age, gender, ethnicity, and social class may be asked to complete a survey about their television program preferences or attitudes toward using 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.

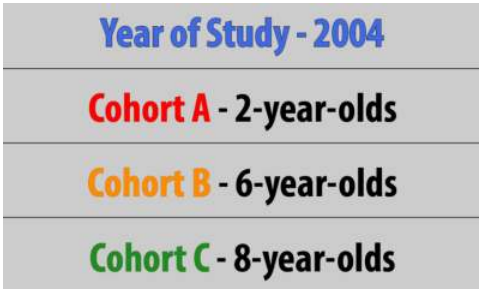


Figure 2.3.2.2: A cross-sectional research design. Image by NOBA is licensed under CC BY-NC-SA 4.0.

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

Sequential Research

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

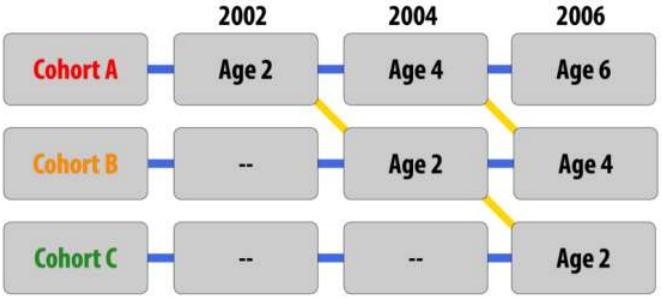


Figure 2.3.2.3: A sequential research design. Image by NOBA is licensed under CC BY-NC-SA 4.0.

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

Table 2.3.2.1: Advantages and Disadvantages of Different Research Designs.

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

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Experiments

Experiments are designed to test hypotheses (or specific statements about the relationship between variables) in a controlled setting, aiming to explain how certain factors or events produce specific 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 will be measured in the study.

Three conditions must be met to establish cause and effect. Experimental designs help meet these conditions. 1. The independent and dependent variables must be related to each other. 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, and 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, thereby 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 do 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 ensure that our subjects' diets remained constant throughout the exercise program. Otherwise, the diet might actually be causing a change in stress levels 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 will be exposed to an independent variable or condition that the researcher is introducing as a potential cause of an event. The control group will be used for comparison and will 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 it helps 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.

References, Contributors, and Attributions

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2.3.3: Mixed-Methods Designs

Learning Objectives

1. Define mixed methods research.
2. Differentiate between qualitative and quantitative data within the mixed methods approach.
3. Compare and contrast sequential and concurrent mixed methods designs

Mixed methods are research approaches that combine both qualitative and quantitative data collection and analysis methods within a single study. This type of approach aims to gain a more comprehensive understanding of phenomena. There are two categories of mixed methods designs: sequential and concurrent (Creswell & Plano Clark, 2007).

Sequential Designs

Explanatory Design

The explanatory design starts with quantitative data and results, and is followed by qualitative data and results, before drawing conclusions. An example of this is the Ages and Stages Questionnaire. Parents or professionals initially rate children based on specific developmental skills and whether those skills can be done not at all, sometimes, or always. At the end of the questionnaire, open-ended questions are asked to provide more context for how the assessor scored the child.

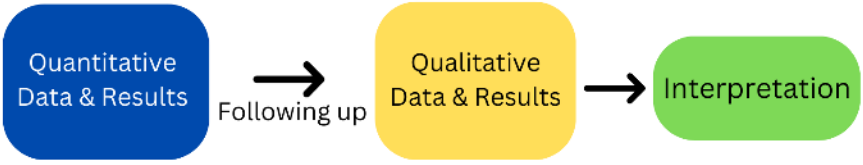


Figure 2.3.3.1: Explanatory Design by Heather Carter is licensed CC-BY-SA 4.0.

Exploratory Design

Exploratory design is the opposite of explanatory- the design starts with qualitative data and builds to collecting and analyzing quantitative data before drawing conclusions. An example of this is rooted in the process for determining whether children need developmental services. The process usually starts with observations to determine what a child can and cannot do. Let's pretend the child is having difficulty getting dressed, feeding, and self-regulating. The Vineland Adaptive Behavior Scales can be used to quantify a child's adaptive skills and assign a score. The score is interpreted to aid in determining the diagnosis of an intellectual or developmental disability, as well as to determine whether the child qualifies for developmental services.



Figure 2.3.3.2: Exploratory Design by Heather Carter is licensed CC-BY-SA 4.0.

Sequential Embedded Design

In this design, qualitative data collection occurs first, followed by a quantitative intervention, and then another round of qualitative data collection after the intervention. Typically, the initial phase informs the next phase, so they are "embedded" in a sequence, with one phase building on the findings of the previous one. This approach allows researchers to deepen their understanding by using different types of data to explore a topic more thoroughly.

For example, in phase 1, you might observe a child struggling to navigate spaces. You recommend that the parent have their eyes checked. In phase 2, the parent takes the child to the optometrist, where an eye exam is conducted using quantitative measures. It is then determined that the child needs corrective lenses. In Phase 3, you observe the child, now wearing the corrective lenses, to see if they can navigate spaces with ease.

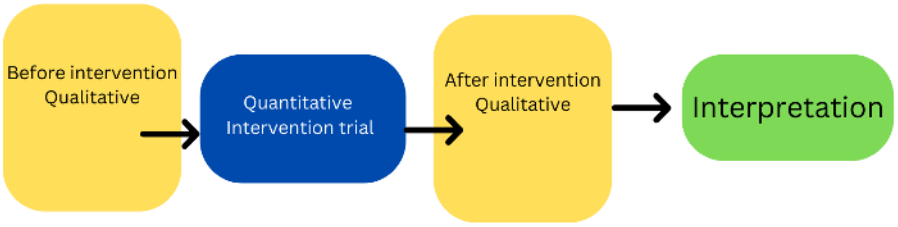


Figure 2.3.3.3: Sequential Embedded Design by Heather Carter is licensed CC-BY-SA 4.0.

Concurrent Mixed Methods Designs

Triangulation Design

In triangulation design, both qualitative and quantitative data are collected and analyzed simultaneously to examine a topic from different angles. The purpose of using this design is to see if the two types of data support each other, or "triangulate," leading to a more robust and comprehensive understanding of the research problem.

In a triangulation design, researchers compare the results from both data types at the end of the study. If both data sources agree (or "converge"), it strengthens the findings. If they disagree, it can provide insights into why differences exist or highlight different aspects of the research topic that might have been missed with only one method.



Figure 2.3.3.4: Sequential Embedded Design by Heather Carter is licensed CC-BY-SA 4.0.

Embedded Design

In this design, quantitative data collection happens first, followed by a qualitative intervention process, and a quantitative post-test. This is similar to the sequential embedded design except that the type of data collection is flipped.

For example, in phase 1, a reading assessment might be given to incoming first graders to determine how many sight words they know. The number is identified and determined to be low; so, in phase 2, the professional applies reading intervention strategies. After two weeks of support, the professional moves to phase 3 by administering the reading assessment again to determine if the strategies were effective for the child, as evidenced by the comparison between the new score and the previous one.



Figure 2.3.3.5: Sequential Embedded Design by Heather Carter is licensed CC-BY-SA 4.0.

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2.4: Ethics in Research

Learning Objectives

1. Describe the historical development and key ethical principles of human research.
2. Explain the role of Institutional Review Boards (IRBs) in approving, monitoring, and safeguarding research involving human participants.
3. Identify potential risks, conflicts of interest, and safeguarding procedures that must be addressed in the research process.
4. Recognize the importance of protecting vulnerable populations and ensuring equitable treatment and participation in research.

Ethics in Research

Once upon a time, research was like the Wild West - there were no rules, limits, or boundaries that researchers had to adhere to. As you can imagine, some researchers did some pretty unethical things.

The first code of principles was established in response to the horrors of WWII - the Nuremberg Code - which outlined principles such as informed consent, absence of coercion, and beneficence toward experimental subjects.

Institutional Review Board

It wasn't until 1979 that the National Commission Report started requiring all research to be reviewed by an Institutional Review Board (IRB). IRBs consist of individuals from an organization who are trained in proper research ethics and protocols, and who determine whether proposed research follows federal and institutional ethical guidelines.

Each institutional IRB has its own application, process, and timeline for reviewing and approving or disapproving research. If you decide to pursue research as part of your educational process or employment, you will be subject to its governing IRB.

Conflicts of Interest

The independence of research should be clear, and any conflicts of interest or biases should be explicitly disclosed. A conflict of interest arises where a researcher’s obligation to the institution or a funder to conduct research independently is likely to be compromised, or may appear to be compromised. This can be because they may:

- obtain a personal gain, or a gain to a member of their family or another person to whom they have a close personal relationship, arising from the research. This gain may be financial or otherwise, and/or,
- have commitments and obligations to another person or body that may appear to act as a potential influence over their independent conduct of the research.

There may be an appearance of conflict of interest even when no conflict actually exists. Researchers must disclose anything during the IRB process that others may perceive as a potential conflict of interest (City, 2024).

Respect for Persons

All research participants must participate voluntarily, free from coercion or undue influence, and their rights, dignity, and autonomy should be respected and protected appropriately.

An autonomous person is capable of deliberation about personal goals and of acting under the direction of such deliberation. To respect autonomy is to give weight to the considered opinions and choices of autonomous persons, while refraining from obstructing their actions unless they are clearly detrimental to others.

By contrast, when a potential research participant lacks the capacity to make autonomous decisions, respect for persons requires that they be protected from harm. The capacity for self-determination matures during an individual's life, and some individuals lose this capacity wholly or in part because of illness, mental disability, or circumstances that severely restrict liberty. Respect for the immature and the incapacitated may require protecting them as they mature or while they are incapacitated. Some people are in need of extensive protection, to the point of excluding them from research that poses a risk of harm (City, 2024).



Figure 2.4.1: Respect for persons needs to be taken into consideration in many different ways. Image is licensed CC BY-NC 4.0.

Informed Consent

Informed consent constitutes four criteria:

1. **Information disclosure** is the process of providing essential research design/methods/protocols information to potential participants and empowers them to make a rational and informed decision about participation (Kadam, 2017)
2. **Competence** refers to a participant's ability to understand the research design, methods, and protocols. Various factors, such as age, cognitive abilities, mental health, etc., can all impact a participant's decision-making capacity and should be taken into consideration as researchers work through the information disclosure process.
3. **Comprehension** refers to a participant's ability to understand the associated risks, benefits, and significance of participating in the study, enabling them to make an informed decision. Researchers need to ensure that what they are communicating during the information disclosure process is being grasped and digested by the sample population. Competence also plays a role in how this information should be expressed.
4. **Voluntary** refers to the participants' willingness to enter the research freely. This also serves as the basis for their right to discontinue participation at any time.

Confidentiality

Depending on the research being conducted, various methods may need to be used to preserve participant confidentiality.

One example is the researcher coding identities numerically. The master key, for which participant is identified by which number, should be kept in a safe and confidential location. What is reported, then, is the correlated identity code.

Table 2.4.1. Example of Researcher's Master Key

Child's Name	Numerical Code	Assessment Score
John Mayer	1	22
Betty Davis	2	28
Miles Keller	3	31
Joan Turner	4	27

Table 2.4.2. Example of Researcher's Master KeyExample of How Research Would be Reported to Protect Confidentiality

Child Code	Assessment Score
1	22
2	28
3	31
4	27

When submitting a research proposal, the principal investigator would have to detail what the process for maintaining confidentiality would look like.

Beneficence and non-maleficence

Research should be worthwhile and provide value that outweighs any risk or harm. Researchers should aim to maximize the benefit of the research and minimize the potential risk of harm to participants and researchers. Robust precautions should mitigate all potential risks and harm.

The need for a favorable risk/benefit assessment requires an assessment of the probabilities of both the harms and the benefits that may arise. The term 'risk' is generally used for harms, but the probability of benefits also needs to be considered. Many kinds of possible harms and benefits need to be taken into account. There are, for example, risks of psychological harm, physical harm, legal harm, social harm, and economic harm, as well as the corresponding benefits. While the most likely types of harm to research participants are those of psychological or physical pain or injury, there may be other social costs to consider.

Discovering what will provide a benefit may require exposing persons to some risk. Conducting research without any risk of causing harm would prevent many improvements in human welfare. Where the participant may benefit directly through the research, such risks are more justifiable. However, where the research project will not directly benefit the participants, the wider benefits to others, such as the potential to alleviate disease or other harms in the future, may justify research with some risk, but only after a very careful evaluation (City, 2024).

Safe-Guarding

Safe-guarding against potential harm is an ongoing process. So, before a study can even begin, the researcher or investigators have to spend significant time weighing the benefits vs. risks and how to mitigate them. Safe-guarding procedures are always outlined as part of the proposal that is sent to the Institutional Review Board (IRB) for review.

Some examples of potential risks include: physical, psychological, social/economic, loss of confidentiality, and legal.

However, there are times when research is underway, and the principal investigator learns of an unexpected adverse event during the study. When this happens, research is paused, and the event is reported to the IRB for further evaluation.

Justice

Individual justice in the selection of participants requires researchers to exhibit fairness so that the burdens and benefits of the research are distributed equitably across different groups within the general population. Justice ensures that no one group is disproportionately burdened or excluded from the potential benefits of the research.

Protected Populations

The federal government guidelines also require that IRBs give special consideration to protecting the welfare of particularly vulnerable subjects, including:

- Children
- Prisoners
- Pregnant women
- Persons who are mentally disabled
- Persons who are economically or educationally disadvantaged

Why? Because individuals in these groups may not be able to make informed decisions for themselves, they may be in situations in which they can easily be manipulated, or they may be a convenient and readily available study population.

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2.5: Relating Ethics to the Profession

Learning Objectives

1. Summarize the key principles and core values outlined in the NAEYC Code of Ethical Conduct.
2. Explain how the NAEYC Code of Ethical Conduct guides decision-making and professional behavior in early childhood education.

NAEYC Code of Ethical Conduct

The following information is adapted from Julian et al. *Introduction to Early Childhood Education* (2023).



Image 4.4.1 Code of Ethics Statement of Commitment NAEYC

A common characteristic of professions is that they have a document spelling out the moral responsibilities to society and guiding principles for professional behavior. Because a profession is viewed as a group that can uniquely meet an important social need, and because the service is often provided to a vulnerable population, it is critical that there is a clear statement about how ethical behavior is defined. Without that, the power that resides in the professional role has the potential to exploit the population being served.

Although the field of early childhood education is still striving to be viewed as a profession, it has had a code of ethics since 1989. However, development of the code began at least 10 years before that (Feeney & Freeman, 2018). Beginning in the mid-70s, **NAEYC** leadership was advancing efforts to develop a code, with a code of **ethical conduct** adopted in 1989. The code was updated in 2005 and most recently reaffirmed and updated in 2011. The code exists as one of several *position statements* that NAEYC has adopted as guides to help early childhood educators make informed decisions on issues facing the field and profession, and to promote dialogue on these issues using a common language provided by the statement. All NAEYC position statements, including the Code of **Ethical Conduct** in its entirety, are available on the association's website, naeyc.org. The code is focused on early childhood educators—those working directly with children and families. Supplements have been written to apply the code to the work of Early Childhood Program Administrators and Early Childhood Adult Educators as well. Multiple articles in

NAEYC's publication *Young Children* have addressed the use of the code, providing professionals with numerous opportunities to practice applying it to real situations faced in early childhood education.

Structure of the Code of Ethical Conduct

The NAEYC Code is organized by several components:

- Core Values
  - Appreciate childhood as a unique and valuable state of the human life cycle
  - Base our work on knowledge of how children develop and learn
  - Appreciate and support the bond between the child and family
  - Recognize that children are best understood and supported in the context of family, culture, community, and society
  - Respect the dignity, worth, and uniqueness of each individual (child, family member, and colleague)
  - Respect diversity in children, families, and colleagues
  - Recognize that children and adults achieve their full potential in the context of relationships that are based on trust and respect
- Conceptual Framework
  - The framework is an organizing structure for the code. It is divided into four sections that address an area of professional relationships: with children, with families, among colleagues, and with the community and society. Each section includes an introduction to the primary responsibilities of the professional in that setting. Each section also lists a set of ideals and principles.
  - **Ideals** are aspirational. They represent what we strive for as we do our work with children and families; they are our goals. **Principles** are more concrete—they could be considered the objectives that allow us to achieve our goals or aspirations (ideals). The principles guide conduct and help professionals resolve **ethical dilemmas**. **Ethical dilemmas** are "moral conflicts that involve determining how to act when an individual faces conflicting professional values and responsibilities" (Feeney & Freeman, 2018, p. 19).
- The four professional relationship areas:
  - Ethical Responsibilities to Children
    - The first section focuses on the profession's beliefs about the unique and valuable nature of childhood and the vulnerability of this stage of development. Consequently, early childhood educators have the responsibility to ensure the safety, health, and emotional well-being of children. Moreover, this section of the code addresses the profession's commitment to respecting individual differences, helping children learn to cooperate with peers, and promoting children's self-awareness, competence, self-worth, resilience, and physical well-being.
    - The first section contains 12 ideals and 11 principles (note that there is no one-to-one correspondence between ideals and principles). The first principle is identified as taking precedence over all the others in the Code:
    - "Above all, we shall not harm children. We shall not participate in practices that are emotionally damaging, physically harmful, disrespectful, degrading, dangerous, exploitive, or intimidating to children" (NAEYC, 2011).
  - Ethical Responsibilities to Families
    - The second section addresses the responsibility to the families that early childhood educators serve. Given the belief that the family is of primary importance and that the family and the teacher have a common interest in the child's well-being, educators have a responsibility to communicate, cooperate, and collaborate with the child's family. The second section contains nine ideals and 15 principles.
  - Ethical Responsibilities to Colleagues
    - The third section of the code addresses responsibilities to colleagues. This section is divided into two subsections, one focused on responsibilities to co-workers and one related to responsibilities to employers. The responsibility to colleagues is to establish and maintain relationships that support productive work and professional needs. The focus here is on trust, confidentiality, collaboration, and respect for the dignity of each human. It also includes responsibility for holding co-workers and employers accountable for their own professional **ethical conduct**. The first subsection contains three ideas and four principles, while the second contains two ideals and five principles.
  - Ethical responsibility to Community and Society

- The final section of the code recognizes the educator's responsibility to provide programs that meet the diverse needs of families, to help families access needed services, to collaborate with other agencies and professionals, and to develop programs that are needed but not available. This section contains seven ideals and 11 principles.

Using the Code of Ethical Conduct

The Code of Ethical Conduct provides a tool that can be used in various ways to ensure **ethical conduct** and resolve **ethical dilemmas** that arise in the complexity of early childhood education. While the code of ethics is a guide, it is not a recipe for specific behaviors to be enacted in any particular situation. However, the Code does identify several specific responsibilities. These **ethical responsibilities** are either things we should not do or things that we are required to do. Some of the responsibilities are presented as ideals, (I) some as principles (P), and include the following:

> I 1.1 To be familiar with the knowledge base of early childhood care and education and to keep current through continuing education and in-service training.
>
> P 2.9 [To]…maintain confidentiality and…[to] respect the family's right to privacy…
>
> I 3 A.1 To establish and maintain relationships of respect, trust, and cooperation with co-workers
>
> I 4.1 To provide the community with high-quality (age and individually appropriate, and culturally and socially sensitive) education/care programs
>
> P 4.7 [To]… be familiar with laws and regulations that serve to protect the children in our programs.
>
> P 1.1 [To] not harm children. [To]…not participate in practices that are disrespectful, degrading, dangerous, exploitative, intimidating, emotionally damaging, or physically harmful to children.
>
> P 2.1 [To]…not deny family members access to their child's classroom or program setting.
>
> P 3C.8 In hiring, promotion, and provision of training…[to] not participate in any form of discrimination based on race, ethnicity, religion, gender, national origin, culture, disability, age, or sexual preference….

These ethical responsibilities are clear-cut. They communicate what must and must not be done. So, one way the code serves your work is by providing clear guidelines on how to behave. In addition, the code is designed to help navigate **ethical dilemmas**. In this case, the professional is faced with two equally justifiable actions, but often includes a conflict between the interests of the two involved parties. For example, it may require prioritizing the needs of the child over those of the parents or a group over an individual. The code can help determine the best course of action in a situation. Still, the process requires thoughtful consideration of the various interests, needs, and priorities of one person or group compared to those of another.

Reflection

Consider this ethical dilemma (from Feeney & Freeman, 2018, pg. 52). Think about how you might resolve this ethical dilemma, considering your professional obligations and conflicting needs.

Kali, the mother of 4-year-old Chase, has asked his teacher, Sondra, to keep him from napping in the afternoon. She tells Sondra, "Whenever Chase naps during the day, he stays up until past 10:00 at night. I have to get up at 5:00 in the morning to go to work, and I am not getting enough sleep." Along with all the other children, Chase takes a one-hour nap almost every day. Sondra feels that he needs it to engage in activities and stay in good spirits through the afternoon.

Application

The authors of the Code suggest a process for applying the code to ethical issues and dilemmas (Feeney & Freeman, 2018). As you consider the steps, think about the situation described in the reflection above. The steps they suggest are described here:

1. Determine if your issue/problem even involves ethics. Does it involve concerns about right and wrong, rights and responsibilities, human welfare, or an individual's best interests? If so, it is an ethical issue.
2. Determine if your issue involves legal responsibility. If so, you must follow the law. Issues involving child abuse are examples involving legal responsibilities.

3. Next, determine if the issue involves an **ethical responsibility**. Recall that ethical responsibilities are clear-cut expectations about how a professional early childhood educator behaves. There is no question about what must be done (or not done).
4. Determine if your issue is a genuine ethical dilemma that requires making hard choices between conflicting moral obligations. Consider the needs of all involved and your professional obligations to each. Are there conflicting obligations requiring you to prioritize one over another? Are core values in conflict? If so, you have an ethical dilemma to resolve. Here are some steps to decision-making about an ethical dilemma:
    a. **Identify the conflicting responsibilities**. Consider the people involved and determine their needs and your obligations to them. Then turn to the Code for guidance. Review the Core Values and Ideals in the related section of the Code. You may need to get more information if you decide you do not have the full picture. It may also be helpful to refer to program policies or community laws.
    b. **Brainstorm possible resolutions**. Now that you fully understand the issue and the conflicting values, needs, and obligations, you can think about how to solve the problem. Do not yet reject any ideas, but generate as many ideas as possible. Then go back and consider the equity and feasibility of your ideas.
    c. **Consider ethical finesse.** In some situations, it may be possible to solve the problem without having to choose between two options. This approach is known as **ethical finesse** and is characterized by the ability to amicably resolve the situation, delicately maneuvering so that no one feels that their needs were not taken into account. For example, in the scenario in the reflection box above, is it possible to resolve the dilemma in a way that addresses both the child's and the parent's needs? Could the teacher work with the parent to develop more effective bedtime routines, or could they experiment with having the child go down for a nap a little later and sleep less time in the afternoon to see if this makes a difference? **Ethical finesse** should be used sparingly (Kipnis, 1987). If we rely too often on **ethical finesse**, it's possible that we're avoiding **ethical responsibility** and not fulfilling our obligations.
    d. **Look for guidance in the NAEYC Code.** If **ethical finesse** does not result in a satisfactory resolution, use the Code to determine the action you can defend morally and prepare to take it. Look to the Core values for guidance. Then review the Ideals and Principles to clarify your responsibilities. Make sure you feel you have all the necessary information. It may also be helpful to review your program's policies or discuss the issue with a trusted colleague.
    e. **Decide on a justifiable course of action.** The next step is to choose between the alternatives, basing your decision on the ethics presented in the Code. In the previous nap-time example, if the attempts to help the parent with bedtime routines and/or a shorter nap did not solve the problem (i.e. the child became sleepy at nap time and was grumpy in the afternoon without a full nap) then the decision to reinstitute the nap procedure for this child is necessary. The responsibility to meet the child's physical needs outweighs the parent's need to get more sleep. It can be difficult to take such a stand, but having the Code and your knowledge of child development on your side of the decision can be reassuring and affirming.
    f. **Implement your resolution and reflect**. After making a decision and putting it into action, it's important to reflect on the process to determine what you've learned. Did you learn something about how you communicate with families? Did you learn something about how program policies are set and shared with parents? Or did you mostly learn about your own comfort level with these kinds of decisions?

Concluding Remarks

Clearly, applying the NAEYC Code of Ethical Conduct is not an easy process. Nonetheless, this important marker of a profession is critical in the work of early childhood education. Given the vulnerability of our clients and the inherent power we wield in that relationship, it is incumbent upon us to be aware of our ethical obligations and become proficient in using tools to assist in carrying out our **ethical responsibilities**. Numerous resources are available from NAEYC for practicing the use of the Code.

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CHAPTER OVERVIEW

3: Theories

3.1: What is a Theory?

3.2: Cognitivism

3.3: Behaviorism

3.4: Constructivism

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3.1: What is a Theory?

Learning Objectives

1. Define what a theory is.
2. Explain the purpose of theories.

What is a Theory?

Students sometimes feel intimidated by theory; even the phrase, “Now we are going to look at some theories...” is met with blank stares and other indications that the audience is now lost. But theories are valuable tools for understanding human behavior; in fact, they are proposed explanations for the “how” and “whys” of development. Have you ever wondered, “Why is my three-year-old so inquisitive?” or “Why do their classmates reject some fifth graders?” 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 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 complex to test, but they are still helpful in stimulating debate or providing concepts with practical applications. 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. There are a couple of ways theories and theorists are classified. For this text, we will focus on how knowledge and learning are acquired.

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3.2: Cognitivism

Learning Objectives

1. Explain how cognitivist theories view learning as internal mental processes.
2. Summarize key contributions of Freud, Erikson, and Kohlberg to developmental theory, including their stage-based models.

Cognitivism

Cognitivism is an umbrella for theories of learning that focus on how information is received, organized, stored, and/or retrieved by the mind. It uses the mind as an information processor, and looks beyond observable behavior, viewing learning as internal mental processes. Some notable cognitivists include:

- Sigmund Freud- *Psychosexual Theory*
- Erik Erikson- *Theory of Psychosocial Development*
- Lawrence Kohlberg- *Theory of Moral Development*
- Jean Piaget could also be listed here

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 field of development; his views on development and psychopathology dominated psychiatry until the rise of behaviorism in the 1950s. His assumptions that personality forms during the first few years of life and that how 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 lead to specific 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.

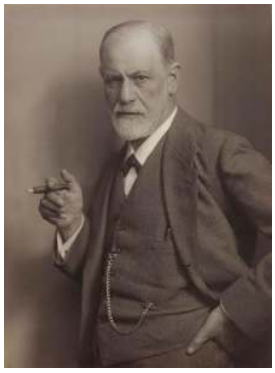


Figure 3.2.1: Sigmund Freud. Image is in the public domain.

Freud's theory of the 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 **3.2.1**: Sigmund Freud's Psychosexual Theory

Name of Stage	Descriptions of Stage
Oral Stage	The **oral stage** lasts from birth until around age 2. The infant is all id. At this stage, all stimulation and comfort is focused on the mouth and is based on the reflex of sucking. Too much indulgence or too little stimulation may lead to fixation.
Anal Stage	The **anal stage** coincides with potty training or learning to manage biological urges. The ego begins to develop at 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. 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 been incorporated 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, challenged Freud's views.[22]

Video	Video Description and Text Link
	*Criticisms of Freud's Ideas* by Heather Carter Text link: https://www.youtube.com/watch?v=gqCbKl0ia_Q

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 about the importance of early childhood experiences provide a framework for later theories (both elaborating and contradicting/challenging 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 unconscious urges do not drive us. 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 provides a guideline for the entire lifespan and suggests certain primary psychological and social concerns at various stages of life.



Figure 3.2.2: Erik Erikson. Image is in the public domain.

Erikson expanded on Freud's work by emphasizing the importance of culture in parenting practices and motivations, and added 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 a 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 **3.2.2**: Erik Erikson's Psychosocial Theory

Name of Stage	Description of Stage
Trust vs. mistrust (0-1)	The infant must have their basic needs met consistently 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 their accomplishments and begin making comparisons with 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)	In our 40s through our early 60s, we focus on being productive at work and home, and are motivated by wanting to feel that we have contributed 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 throughout the lifespan. 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 heavily on stages and assuming that completing one stage is a prerequisite for the next stage 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]

Video	Video Description and Text Link
	Erikson's theory of psychosocial development identifies eight stages in which a healthy individual should pass through from birth to death. At each stages we encounter different needs, ask new questions and meet people who influence our behavior and learning. *8 Stages of Development by Erikson* by Sprouts. Text link: https://www.youtube.com/watch?v=aYCBdZLCDBQ

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 a 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.

Lawrence Kohlberg's *Theory of Moral Development*

Kohlberg (1963) built on Piaget's work and was interested in understanding how our moral reasoning changes as we age. 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 reasoning. To study moral development, Kohlberg posed moral dilemmas to children, teenagers, and adults, such as the following:

> *A man's wife is dying of cancer and there is only one drug that can save her. The only place to get the drug is at the store of a pharmacist who is known to overcharge people for drugs. The man can only pay $1,000, but the pharmacist wants $2,000, and refuses to sell it to him for less, or to let him pay later. Desperate, the man later breaks into the pharmacy and steals the medicine. Should he have done that? Was it right or wrong?*
>
> *Why? (Kohlberg, 1984)*

Table **3.2.2** Lawrence Kohlberg's Levels of Moral Reasoning

Age	Moral Level	Description
Young children- usually prior to age 9	Preconventional morality	**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.
Older children, adolescents, and most adults	Conventional morality	**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.
Rare with adolescents and few adults	Postconventional morality	**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 evolves from an early emphasis on punishment and social rules and regulations to a focus on more general ethical principles, like Piaget's approach, Kohlberg's stage model is probably too simplistic. 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. Gilligan (1982) has argued that, due to differences in their socialization, males tend to value principles of justice and rights, while females tend to value caring for and helping others. Although there is little evidence for a gender difference in Kohlberg's stages of moral development (Turiel, 1998), it is true that girls and women tend to focus more on issues of caring, helping, and connecting with others than do boys and men (Jaffee & Hyde, 2000).[25]

Video	Video Description and Text Link
	*Kohlber's Theory of Moral Development* created by Shreena Desai Text link: https://www.youtube.com/watch?v=Onkd8tChC2A

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3.3: Behaviorism

Learning Objectives

1. Identify behaviorist principles.
2. Differentiate between classical conditioning and operant conditioning.
3. Explain how reinforcement, punishment, and modeling influence children's behavior and learning.

Behaviorism

While cognitivists examined what was going on in the mind, behaviorism rejected any reference to the mind and viewed overt, 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]

Classical Conditioning

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 while eating, he noticed that they actually began to salivate before the food arrived, as the researcher walked down the hall and approached the cage. “This,” he thought, “is not natural!” One would expect a dog to salivate when food hits their palate automatically, 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 3.3.1: Ivan Pavlov. Image is in the public domain.

Pavlov began to experiment with this concept of **classical conditioning**. He began to ring a bell, for example, before 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 that makes the dog salivate. One is natural (unconditioned), and the other is learned (conditioned).

Let’s think about how classical conditioning is used on us. One of the most widely applied applications of classical conditioning principles was introduced by the psychologist John B. Watson.

John B. Watson

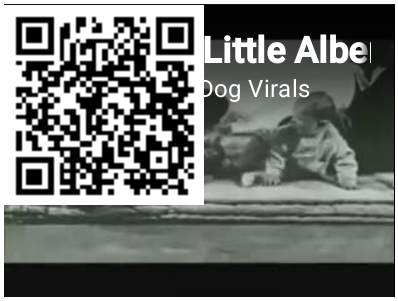
John B. Watson (1878-1958) believed that most of our fears and other emotional responses are classically conditioned. He gained a good deal of popularity in the 1920s with his expert advice on parenting, which he offered to the public.



Figure 3.3.2: John B. Watson. Image is in the public domain.

He tried to demonstrate the power of classical conditioning with his famous experiment with an 18-month-old boy named “Little Albert”. Watson sat Albert down and introduced a variety of seemingly scary objects to him: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear of loud noises, so he proceeded to make a loud noise each time he introduced one of Albert’s favorites, a white rat. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced.

Watson filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow his advice. Watson wrote columns in newspapers and magazines, which gained a lot of popularity among parents eager to apply science to their household chores.

Video	Video Description and Text Link
	Actual footage from the Little Albert Experiment in which a baby is conditioned to fear fluffy animals. It is now considered to be one of the early twentieth century's most unethical experiments. However, the research was also groundbreaking for it's time and is considered the first modern-day experiment of its kind to show that a human could be classically conditioned. *The Little Albert Experiment* by News Dog Virals Text link: https://www.youtube.com/watch?v=5duLMjaTL0U

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.

Operant Conditioning

B. F. Skinner (1904-1990), who introduced the principles of operant conditioning, suggested that reinforcement is a more effective means of encouraging a behavior than 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 3.3.3: B. F. Skinner. Image is in the public domain.

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

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

The use of **positive reinforcement** involves adding something to a situation 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 something unpleasant is removed from a situation to encourage a 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 (1925-2021) 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; instead, they are learned by watching others (1977). Young children frequently learn behaviors through imitation.



Figure 3.3.4: Albert Bandura. Image by Albert Bandura is licensed under CC BY-SA 4.0.

Sometimes, particularly when we do not know what else to do, we learn by modeling or copying the behavior of others. A kindergartner on their first day of school might eagerly observe 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 no TV? Bandura et al. (1963) began a series of studies to examine the impact of television, particularly commercials, on children's behavior. 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 doll, also known as a "Bobo" doll. Then the children were allowed into the room, where they found the doll and immediately began hitting it. This was without any reinforcement whatsoever. Not only that, but they found new ways to behave aggressively. It's as if they've taken on an aggressive role.

Video	Video Description and Text Link
	*Bandura's Bobo Doll Experiment* by Everywhere Psychology Text link: https://www.youtube.com/watch?v=dmBqwWlJg8U

Children view far more television today than they did in the 1960s; so much, in fact, that they have been referred to as Generation M (for media). The amount of screen time varies by age. As of 2017, children aged 0-8 spend an average of 2 hours and 19

minutes. Children aged 8-12 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 on entertainment media.

The prevalence of violence, sexual content, and messages promoting foods high in fat and sugar in the media is 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 continue to change. The popularity of YouTube and the various social media platforms is an example 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 a stimulus (the dog's salivation to the sound of 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.

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3.4: Constructivism

Learning Objectives

1. Explain the key principles of constructivist learning theory.
2. Compare and contrast the cognitive development theories of Jean Piaget and Lev Vygotsky.
3. Describe Bronfenbrenner's ecological systems theory and Thelen's dynamic systems theory as constructivist frameworks that emphasize the role of context and interrelated systems in child development.

Constructivism

Constructivism is an umbrella for theories of learning based on the idea that learners do not acquire knowledge and understanding by passively perceiving it. Instead, learners need to interact with it through direct experience and social engagement. Some notable constructivists include:

- Jean Piaget- *Theory of Cognitive Development*
- Lev Vygotksy- *Sociocultural Theory*
- Urie Bronfenbrenner- *Ecological Systems Theory*
- Esther Thelen- *Dynamic Systems Theory*

Bronfenbrenner's theory could also be classified as Behaviorism, depending on the perspective taken, as it has overlap within both umbrella terms.

Jean Piaget's *Theory of Cognitive Development*

Jean Piaget (1896-1980) is one of the most influential theorists of cognitive development. 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 how children's thought differs from those of adults. His interest in this area began when he was asked to test the IQ of children, and he noticed a pattern in their incorrect answers. He believed that children's intellectual skills change over time through maturation. Children of differing ages interpret the world differently.



Figure 3.4.1: Jean Piaget. Image is in the public domain.

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

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

Video	Video Description and Text Link
	A schema is a cognitive framework or concept that helps organize and interpret information. Jean Piaget, who coined the term, argued that we construct our experiences into schemata so we can make sense of the world. *Piaget's Schema: Accomodation and Assimilation of New Information* by Sprouts Text link: https://www.youtube.com/watch?app=de...&v=EYbCE1udazw

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 minds. We can make a cognitive accommodation to this new experience by adding a new schema. This food is unlike anything I’ve tasted before. I now have a new category of foods that are bittersweet in flavor, for instance. This is **accommodation**. Do you accommodate or assimilate more frequently? Children accommodate more frequently as they build new schemas. 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 **3.4.1**: Jean Piaget’s Theory of Cognitive Development

Name of Stage	Description of Stage
Sensorimotor Stage	During the **sensorimotor stage,** children rely on using their senses and motor skills. From birth until about age 2, the infant learns about objects by tasting, smelling, touching, hearing, and moving them 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 in the form of words or gestures, facilitates understanding and communication 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, between the ages of 7 and 11, develop the ability to think logically about the physical world. Middle childhood is a time of understanding concepts such as size, distance, and the constancy of matter, as well as 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, around age 12, acquire the ability to think logically about both concrete and abstract events. The teenager who has reached this stage can consider possibilities and contemplate ideas about situations that have never been directly encountered. A more abstract understanding of religious ideas, morals, 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]

Piaget's Stages at Work

Using visual aids and photo representations of daily schedules, transitions, classroom rules, learning activities, etc., all stem from Piaget's thoughts about how children think in the pre-operational stage.



Figure 3.4.2: Classroom rules visual aid. Image by Heather Carter is licensed CC BY-SA 4.0.

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 changes as their cognitive skills mature through four stages: the sensorimotor stage, the preoperational stage, the concrete operational stage, and the 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 and became more widely known in the 1980s. Vygotsky differed from Piaget in that he believed a person not only has a set of abilities, but also a set of potential abilities that can be realized with 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 a capable peer, a child can learn cognitive skills within a certain range, known as the **zone of proximal development**.[34] He believed 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 3.4.3: Lev Vygotsky. Image by The Vigotsky Project is licensed under CC BY-SA 3.0.

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

ZPD and Scaffolding at Work

Video	Video Description and Text Link
	It can be super frustrating to learn something new! We've all been there. When we support our children in their zone of proximal development, then optimal learning occurs! A big part of staying in their zone of proximal development means we let them figure it out a bit and then offer support when they are stuck. We don't expect children to learn or figure something out that is too difficult for them and also we want there to be a little bit of a challenge or else they are not actually learning anything. *The Zone of Proximal Development* by The Peaceful Sleeper Text link: https://youtu.be/JONHiVXrx3s

There is a lot of modern pedagogy in working with young children centered around Piaget's and Vygotsky's work. One example of utilizing a child's zone of proximal development and scaffolding is learning to write.

1. Writing starts at birth with ***pre-writing skills***, including grasping and eye-hand coordination.
2. Eventually, we encourage children to utilize writing in intentional ways that represent something, known as ***emerging writing***.
3. ***Transitional writing*** is characterized by a one-to-one relationship between the letters and sounds represented in children's writing. For example, words like 'people' could be spelled 'pepl'. Even though children's writing has now reached a level where it may be read by others, providing conventional writing is still very important in writing progress. Children will learn through comparison that many letters have different sounds and that some are silent. At the same time, children will start to notice and learn about the use of punctuation and capital letters.
4. From there, we introduce various activities that encourage children to use their hands and work their fine-motor muscles to ***support writing*** such as sensory play, art, blocks, puzzles, woodworking, and more.



Figure **3.4.4**: Writing in preschool. Image by Heather Carter is licensed CC BY-SA 4.0.

Comparing Piaget and Vygotsky

Vygotsky concentrated more on the child's immediate social and cultural environment and their 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 other 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 depend on who is involved in the life of a child and on when and where a child lives.

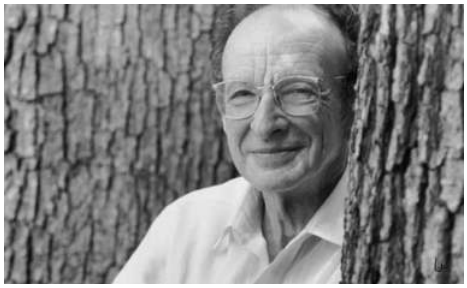


Figure **3.4.5**: Urie Bronfenbrenner. Image by Marco Vicente González is licensed under CC BY-SA 4.0.

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

Table **3.4.4**: Urie Bronfenbrenner's Ecological Systems Model

Name of System	Description of System
Microsystems	**Microsystems** impact a child directly. These are the people with whom the child interacts, such as parents, peers, and teachers. The relationship between individuals and those around them needs 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, peers, and schools that operate under policies and regulations found in these institutions.
Macrosystems	We find cultural values and beliefs in what we refer to as **macrosystems**. These larger ideals and expectations inform institutions that will ultimately impact the individual.
Chronosystem	All of this happens in a 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, to understand a student in math, we can't simply look at that individual and the challenges they face directly with the subject. We need to examine the interactions that occur between the teacher and the child. Perhaps the teacher needs to make modifications as well. The teacher may be responding to regulations set by the school, such as new expectations for students in math or time constraints that interfere with the teacher's ability to instruct. These new demands may be a response to national efforts to promote math and science, which were deemed important by political leaders at a particular time in history due to relations with other countries.

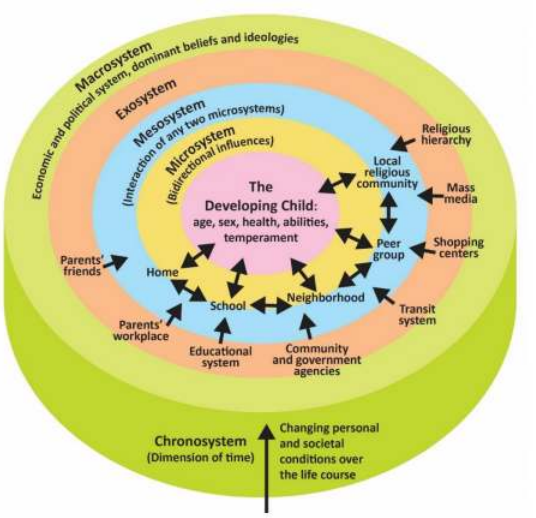


Figure **3.4.6**: Bronfenbrenner's ecological systems theory. Image by Ian Joslin is licensed under CC BY 4.0.

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

Video	Video Description and Text Link
	A brief overview of Bronfenbrenner's ecological theory. *Bronfenbrenner's Ecological Theory* by Rachelle Tannebaum Text link: https://www.youtube.com/watch?v=HV4E05BnoI8

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 a child's life, and where and when they live, are important considerations.
- He created a model of nested systems that influence the child (and are influenced by the child), including microsystems, mesosystems, exosystems, macrosystems, and chronosystems.

Esther Thelen's *Dynamic Systems Theory*

Esther Thelen's (1931-2004) research focused on how babies learn to walk and interact with their surroundings. What emerged was the Dynamic Systems Theory (DST). DST is a framework for understanding how internal systems behave and change over time. Additionally, all aspects of the system, or in early childhood development, interact. The theory posits that development is non-linear in nature, but critical changes in one system can affect the others. Dynamic Systems Theory helped prompt the understanding that we need to teach and consider the "whole child" because learning and development across all domains are interrelated.



Figure 3.4.7: Esther Thelen with test subject. Image is in the public domain via the IU Digital Library Program and Indiana University Office of University Archives and Records Management.

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CHAPTER OVERVIEW

4: Developmentally Appropriate Practices

4.1: What is DAP?

4.1.1: Commonality

4.1.2: Individuality

4.1.3: Context

4.2: NAEYC Guidelines for DAP

4.3: The Cost of Ignoring DAP

4.4: Supporting DAP

4.5: Play Based Learning

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SECTION OVERVIEW

4.1: What is DAP?

Learning Objectives

By the end of this section, you should be able to:

1. Define developmentally appropriate practices (DAP) in early childhood.
2. Explain the role of DAP in fostering healthy child development and learning.

Early childhood is a critical time for learning and development, shaping the foundation for future success. But how do we ensure that young children receive the best possible learning experiences? One of the most effective approaches is **Developmentally Appropriate Practice (DAP)**, a research-based framework that helps early childhood professionals, caregivers, and families support children's growth in meaningful and effective ways.

The concept of DAP can sometimes be misunderstood. Some assume it simply means letting children play without structure, while others think it focuses solely on meeting academic milestones. In reality, DAP is a balance—it is about meeting children where they are developmentally while challenging them just enough to foster continued growth (National Association for the Education of Young Children [NAEYC], 2020).

To apply DAP, professionals and caregivers consider three core components:

1. *commonality* (how a practice pertains to developmental domains and a child's age),
2. *individuality* (how a practice considers a child's interests and needs), and
3. *context* (how a practice addresses a child's social and cultural background).

By considering these three factors, early childhood professionals and caregivers can make informed decisions about the best ways to support children's development.

What DAP Is and Isn't

Developmentally Appropriate Practice (DAP) prioritizes hands-on, play-based, and meaningful learning rather than rigid, one-size-fits-all instruction. DAP is intentional and responsive, allowing early childhood professionals and caregivers to scaffold learning by providing challenges that are just beyond a child's current abilities while offering the necessary support to help them succeed. It fosters growth in all areas—creative, social, emotional, physical, cognitive and language development—rather than focusing solely on academic skills.

Contrary to common misconceptions, DAP is not about letting children do whatever they want without guidance or structure. It also does not mean delaying academic learning; rather, it integrates early literacy, math, and problem-solving skills in ways that are engaging and appropriate for young learners. DAP does not force children into adult-like expectations, such as sitting still for long periods or completing worksheets that do not align with their developmental level. Additionally, it is not a one-size-fits-all approach—effective DAP acknowledges that each child learns at their own pace and that cultural and family contexts shape learning experiences. By ensuring that teaching and caregiving practices align with how children naturally grow and develop, DAP provides a foundation for lifelong learning and well-being.

Why DAP Matters

One of the key reasons DAP matters is that it supports optimal brain development. Research in child development and neuroscience shows that children learn best through active engagement, exploration, and meaningful interactions. When learning experiences align with a child's developmental stage, they are more likely to be engaged, motivated, and able to retain new information. Providing hands-on, play-based, and inquiry-driven activities strengthens cognitive, social, emotional, and physical skills in a way that worksheets and rote memorization cannot.

DAP also fosters a love of learning by ensuring that educational experiences are not only appropriate but also enjoyable. When children feel safe, supported, and challenged at the right level, they develop confidence in their abilities and a willingness to take on new challenges. This intrinsic motivation lays the groundwork for future academic success and lifelong curiosity. Conversely, when learning expectations are mismatched—either too challenging or not stimulating enough—children may become frustrated, disengaged, or anxious, which can lead to negative associations with learning.

Social and emotional development is another critical area that DAP nurtures. By valuing relationships, self-expression, and problem-solving, DAP helps children build strong communication skills, empathy, and self-regulation. Teachers, caregivers, and early childhood professionals who implement DAP recognize that children are not just developing academically but also learning how to navigate the world socially and emotionally. By fostering secure attachments and responsive relationships, DAP supports children's emotional resilience and ability to work with others, which are essential life skills.

Cultural and individual diversity also play a central role in DAP. Every child brings a unique background, learning style, and set of experiences to their educational environment. When early childhood professionals and caregivers apply DAP, they acknowledge and respect these differences, ensuring that learning is inclusive and relevant. This might mean incorporating materials and experiences that reflect diverse cultures, using multiple ways to engage children with different learning preferences, or adapting activities to meet individual needs. By embracing diversity and tailoring experiences accordingly, DAP creates an equitable learning environment where all children can thrive.

Ultimately, DAP ensures that children receive the right kind of support at the right time. It provides a strong foundation for academic achievement, emotional well-being, and social competence, while also respecting and valuing each child's unique journey. When early childhood professionals, caregivers, and families implement DAP, they are not just teaching children—they are shaping confident, capable, and curious learners who are prepared to succeed in school and in life.

Topic hierarchy

4.1.1: Commonality

4.1.2: Individuality

4.1.3: Context

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This page is adapted from 5.5 Developmentally appropriate practice. by Blums & Holloway, S. in Julian, G., Boyd, B., Blums, A., Moon, C., Sharpe-Haygood, D., Karshna, J., Leek, S., Neimer, A., & Gill, N. (2024). (1.1 Eds). *Introduction to Early Childhood Education*. Libretexts.

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4.1.1: Commonality

Learning Objectives

By the end of this section, you should be able to:

1. Identify key elements of commonality in developmentally appropriate practices.
2. Explain how commonality in child development and learning applies to all children.

Commonality is representative of the *current research and understandings of processes of child development and learning that apply to all children, including the understanding that all development and learning occur within specific social, cultural, linguistic, and historical contexts* (NAEYC, 2020).

Considerations of Development and Theory

When professionals consider development in planning curriculum, it means understanding what is appropriate at a given age or stage of development. Developmental milestone charts can help with this. It is vital to know what children should be capable of at a given age of development and plan activities accordingly. For instance, we know that young children are concrete thinkers who learn best by using real, tangible items rather than representations of items. If we want a group of 3-year-old children to learn about apples, we will give them real apples to smell, touch, see, and taste. In this way, they can develop a long-lasting, deeper understanding of apples. This is developmentally appropriate. Offering a child a book about apples may be a useful support and vital for language development, but the book alone will never give them a conceptual understanding of apples.

Likewise, well-meaning families often expect early childhood professionals to have children complete worksheets in preschool. From what we know about child development, young children do not have the **executive function** (mental skills including memory, flexible thinking, and self-control) to allow them to sit in a chair for long periods of time to learn from worksheets. Further, their bodies are designed to wiggle and move. Sitting at a desk will not help preschoolers learn. That is why many high-quality early childhood programs focus on play-based learning (Blums & Holloway in Julien et.al, 2023).

Principles of Child Development and Learning

NAEYC has put forth nine principles and their implications for early childhood education professional practice.

1. Development and learning are dynamic processes that reflect the complex interplay between a child's biological characteristics and the environment, each shaping the other as well as future patterns of growth.
2. All domains of child development are important; there is a bi-directional influence in that each domain both supports and is supported by the others.
3. Play promotes joyful learning that fosters learning in all developmental domains, as well as content knowledge across disciplines. Play is essential for all children, from birth through age 8.
4. Although general progressions of development and learning can be identified, variations due to cultural contexts, experiences, and individual differences must also be considered.
5. Children are active learners from birth, they are constantly taking in and organizing information to create meaning through their relationships, their interactions with their environment, and their overall experiences.
6. Children's motivation to learn is increased when their learning environment fosters their sense of belonging, purpose, and agency. Curricula and teaching methods build on each child's assets by connecting their experiences in the school or learning environment to their home and community settings.
7. Children learn in an integrated fashion that cuts across academic disciplines or subject areas. Because the foundations of subject-area knowledge are established in early childhood, educators need subject-area knowledge, an understanding of the learning progressions within each subject area, and pedagogical knowledge about teaching each subject area's content effectively.
8. Development and learning advance when children are challenged to achieve at a level just beyond their current mastery and when they have many opportunities to reflect on and practice newly acquired skills.
9. Used responsibly and intentionally, technology and interactive media can be valuable tools for supporting children's development and learning.

Social and Cultural Learning

Social and cultural learning also influences how children grow and learn, such as the uniqueness of their family and where the family lives. As social and cultural settings change, the ways children grow and learn change too. "Social and cultural aspects are not simply ingredients of development and learning" (NAEYC)—these shape how it happens. For instance, play is something all children engage in, but how they play can vary depending on where they're from. So, teachers need to recognize both what all children share in their development and how those similarities can look different because of where they live and their culture.

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4.1.2: Individuality

Learning Objectives

1. Describe the importance of recognizing and respecting individual differences in children when applying developmentally appropriate practices (DAP).

Individuality is defined as *the characteristics and experiences unique to each child, within the context of their family and community, which have implications for how best to support their development and learning* (NAEYC, 2020). Considering an individual child's needs means knowing what is appropriate for a given child. Early childhood professionals must take time to get to know the child as an individual and as a family and community member. The way this is determined is through a variety of methods:

- Reflection on the professional's knowledge of the community;
- Seeking information from the family through formal (conferences, family events, requesting parents also complete assessment tools, etc.) and informal means (daily communication, child information sheets upon enrollment, etc.);
- Observing the child;
- Examining the child's work;
- Using authentic, reliable, and valid individual child assessments.

The curriculum should be tailored to each child's different developmental needs. Perhaps there is an art activity in the classroom in which children cut paper with scissors and glue it onto a larger sheet. If some children do not have strong scissor skills, they may rip paper instead and use glue sticks to glue it down. In this way, children's individual developmental needs are met. They still can practice fine motor skills with art, but it is not designed to limit children by ability level. This type of planning is one of the hallmarks of early childhood professionals – the thoughtful practice of tailoring activities to meet children's individual needs. This practice is also referred to as **differentiation,** where the teacher understands and implements the idea that "one size does not fit all" (Blums & Holloway in Julien et.al, 2023)

Diversity Beyond Skills Alone

Early childhood professionals must also understand that each child's knowledge, skills, abilities, interests, and needs contribute to the overall diversity among the group, and that these differences extend to:

- How children see themselves and their social identity within their community/culture;
- Interests, preferences, and strengths that children, and others, acknowledge and/or express;
- Children's temperament, personalities, motivations, and approaches to learning;
- Cultural knowledge, including all facets of language.

Recognizing this diversity, and the opportunities it offers to support all children's learning, exemplifies a model for appreciating each child's unique strengths and talents.

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4.1.3: Context

Learning Objectives

1. Explain how the context supports the creation of more effective and meaningful learning experiences.

Context refers to *everything discernable about the social and cultural contexts for each child, each professional, and the program as a whole* (NAEYC, 2020)

To consider culture in developmentally appropriate practice is to keep in mind the context in which the child is raised. Each family's set of rules, way of communicating, neighborhood, history, status, and environment is unique. While there are some universals, what is considered developmentally appropriate for one culture may not be for another culture. For instance, the ways adults talk with children can vary widely depending on the culture. Some cultures rely heavily on verbal communication while others rely more on non-verbal communication. Cultures can also vary in their norms around children's freedom to move freely around a space. Some cultures allow children to move freely while others expect that children ask permission from an adult. Differences in these norms may mistakenly be seen as behavior issues by professionals (Blums & Holloway in Julien et.al, 2023).

Culturally relevant pedagogy is the practice of including ideas and artifacts that refer to a child's individual culture. This concept also extends to assessments. When measuring development using assessments, it is important to consider the cultural relevancy of the assessment. Does the assessment allow for children who speak multiple languages or those who do not have a familiarity with classroom materials? Imagine, for instance, that your assessment references American football. What happens when you have a child in your class who has just moved from India? Will her assessment be meaningful if she doesn't understand the rules of American football? Teachers can be mindful of such differences when assessing children. The best way to stay informed about cultural practices is to develop reciprocal communication and strong relationships with the children's families (Blums & Holloway in Julien et.al, 2023).

With regard to context, and developmentally appropriate practice, in general, it is important for early childhood professionals to recognize and fight against their own biases and the biases in society that could undermine a child's growth and well-being. Part of working towards this goal is committing to the professional responsibility of being a life-long learner and fostering life-long learning in children. This means staying up-to-date on research, as well as listening and learning from the families and communities they work with (NAEYC, 2020)

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4.2: NAEYC Guidelines for DAP

Learning Objectives

1. Outline the NAEYC guidelines for developmentally appropriate practices (DAP).
2. Explain the role of DAP in shaping high-quality early childhood education.

NAEYC has outlined guidelines that help early childhood professionals engage in developmentally appropriate practice. These guidelines are summarized below, but for a deeper look please refer to the Developmentally Appropriate Practice Position Statement from the National Association for the Education of Young Children.

The guidelines are as follows:

1. Creating a caring community of learners
2. Engaging in reciprocal partnerships with families and fostering community connections
3. Observing, documenting, and assessing children's development and learning
4. Teaching to enhance each child's development and learning
5. Planning and implementing an engaging curriculum to achieve meaningful goals
6. Demonstrating professionalism as an early childhood professional

These guidelines go beyond child development and reach the larger context of teaching and learning in early childhood settings. Each of the six guidelines plays a role in creating a developmentally appropriate learning experience for children.

Creating a caring community of learners refers to how teachers create respectful interactions, positive relationships, and a supportive environment that focuses on the strengths that each child and family brings.

Engaging in reciprocal partnerships with families and fostering community connections refers to how teachers establish two-way communication with families that respects varying communication styles, create multiple types of opportunities for family participation, and use families as a source of information for each child. It is important to also consider the community to which the program belongs and develop practices that honor and respect the community.

Observing, documenting, and assessing children's development and learning is how teachers measure how children are progressing in their development. This refers to watching and systematically observing children at play, keeping track of these observations using some type of system or tool, and later using that information to draw conclusions about how a child is meeting developmental goals.

Teaching to enhance each child's development and learning means that teachers use child development principles to foster learning. One main way to achieve this is through play-based learning. It also means that teachers use direct instruction in effective ways that meet children's needs and create learning experiences that are varied in format and complexity.

Planning and implementing an engaging curriculum to achieve meaningful goals refers to taking time to reflect and consider children's individual developmental goals and create learning experiences around those goals. These goals come from the observations and assessments that have been previously carried out. Curriculum should also include all developmental domains (physical, cognitive, emotional, and social) and learning content areas (art, music, math, science, and language/literacy).

Demonstrating professionalism as an early childhood professional is achieved in many ways. One way to demonstrate professionalism is to follow the Professional Standards and Competencies for Early Childhood Educators from NAEYC.

Final Thoughts

Understanding child development is a vital skill for all early childhood teachers. Knowing the key features of the developmental domains- physical, cognitive, social, and emotional is a good start. Making sure that both typically developing and atypically developing children's needs are met is a requirement of good early childhood education. Implementing developmentally appropriate practice is critical to quality teaching. As with all things, understanding child development and its connection to developmentally appropriate practice takes time. It means seeking new knowledge and staying connected to the children in your care (Blums & Holloway in Julian, et.al, 2023).

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4.3: The Cost of Ignoring DAP

Learning Objectives

1. Explain the role of play-based, developmentally appropriate experiences in supporting young children's development.
2. Describe how stress and rigid academic expectations can impact brain development and children's engagement with learning.

In many early childhood programs, pressure to push academics too early or standardize learning leads to practices that may not support how young children actually learn and grow. Ignoring DAP can have serious consequences for children, affecting not only their academic success but also their emotional well-being and long-term attitudes toward learning.

What Happens When We Ignore DAP?

1. Children thrive in environments where learning is engaging and suited to their developmental stage. When they are expected to sit still for long periods, complete worksheets beyond their skill level, or memorize facts without meaningful context, they may feel overwhelmed or anxious (Elkind, 2007). Research shows that stress in early learning environments can negatively impact brain development, making it harder for children to process and retain information (Shonkoff & Phillips, 2000).
2. Young children learn best through hands-on, play-based experiences that allow them to explore and make sense of the world (NAEYC, 2020). When instruction is too rigid—focusing on drills, repetitive tasks, or unrealistic academic expectations—learning feels like a chore rather than an exciting discovery. Over time, children may lose their natural curiosity and disengage from the learning process.
3. When children struggle with developmentally inappropriate expectations, they may be unfairly labeled as "behind", "disruptive", "struggling learners" (Miller & Almon, 2009). In reality, they may simply be reacting to an environment that doesn't match their developmental needs. Such labels can negatively impact their self-esteem and how teachers and caregivers perceive their abilities.
4. A strong foundation in social and emotional skills—such as self-regulation, cooperation, and problem-solving—is essential for later success (Denham, Bassett, & Zinsser, 2019). When early childhood education focuses solely on academics at the expense of play and social interaction, children miss out on key opportunities to build these critical skills.

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4.4: Supporting DAP

Learning Objectives

1. Identify key strategies that support developmentally appropriate practice from infancy through middle childhood.

Ensuring young children receive the best possible start requires developmentally appropriate strategies that align with their age, individual development, and cultural background (NAEYC, 2020). Whether you are a parent, caregiver, practioner, or early childhood educator, or other professional supporting young children, you play a vital role in fostering environments that promote learning and well-being. Below are key ways to support Developmentally Appropriate Practice (DAP) from infancy through age 8.

Developmentally Appropriate Practices for All Ages

- **Play-Based Learning** – Play is the primary way children learn at all ages. Open-ended materials, pretend play, exploration, and problem-solving opportunities allow children to develop cognitive, social, emotional, and physical skills (Miller & Almon, 2009).
- **A Safe and Nurturing Environment** – Children need secure, supportive relationships with caregivers and a physically safe setting to explore freely. Predictable routines, responsive interactions, and age-appropriate supervision foster emotional security (Shonkoff & Phillips, 2000).
- **Respect for Individual Differences** – Children develop at different rates and in different ways. Providing flexible learning experiences that accommodate various interests, strengths, and cultural backgrounds helps all children thrive (NAEYC, 2020).
- **Encouraging Communication and Language Development** – Talking, singing, reading, and engaging in meaningful conversations help children build vocabulary and comprehension skills. Caregivers should respond to children's verbal and nonverbal cues across all ages (Center on the Developing Child, 2020).
- **Opportunities for Social-Emotional Growth** – Teaching emotional regulation, problem-solving, cooperation, and self-expression prepares children for lifelong success in relationships and learning. Strategies like modeling empathy, using emotion-coaching techniques, and encouraging peer interactions support these skills (Denham et al., 2019).
- **Culturally Responsive Practices** – Recognizing and incorporating children's cultural and family backgrounds into learning experiences helps create a sense of belonging and respect for diversity. Families, caregivers, and educators should use materials, stories, and activities that reflect a wide range of perspectives (NAEYC, 2020).



Figure 4.4.1. Grandfather and infant enjoying outdoor water play. Image by Aymane Hanni is licensed by Pexels.

Supporting Infants

- **Responsive Caregiving** – Infants thrive when their needs for comfort, security, and connection are met. Holding, talking, making eye contact, and responding promptly to cries and coos builds trust and emotional security (Shonkoff & Phillips, 2000).
- **Safe Exploration** – Whether at home or in a childcare setting, create a sensory-rich environment with soft toys, mirrors, and textured materials. Floor time for tummy play supports motor skill development.
- **Language Development** – Talking, singing, and reading aloud stimulate brain development and early communication. Caregivers and professionals can strengthen serve-and-return interactions by responding to infants' babbling and gestures

(Center on the Developing Child, 2020).

Supporting Toddlers

- **Encouraging Independence** – Provide toddlers with safe opportunities to explore, make simple choices (e.g., "Do you want the red cup or the blue cup?"), and practice self-help skills like handwashing and feeding.
- **Hands-On Learning** – Toddlers learn by doing. Whether at home or in an early learning program, offer opportunities for movement, sensory play with water or sand, and pretend play with real-world objects.
- **Emotional Coaching** – Toddlers experience big emotions but lack the words to express them. Caregivers and practitioners can help by labeling emotions, modeling calming techniques, and offering comfort and guidance (Denham et al., 2019).
- **Social Interaction** – Encourage toddlers to engage in parallel and cooperative play. Provide opportunities for turn-taking and sharing, while understanding that social skills develop gradually.

Supporting Preschoolers

- **Play-Based Exploration** – Activities like building with blocks, engaging in dramatic play, and experimenting with art and music foster creativity and problem-solving.
- **Early Literacy and Numeracy** – Daily experiences like storytelling, counting, and pattern recognition prepare children for future learning.
- **Respecting Individual Learning Styles** – Some children thrive in active learning, while others prefer observation. Providing varied activities allows all children to participate in ways that suit them.
- **Self-Regulation and Social Skills** – Teaching children how to express emotions, resolve conflicts, and work with peers supports their readiness for school and social interactions.



Figure 4.4.2. Two young girls using watering cans for gardening. Image by RDNE Stock project is licensed by Pexels.

Supporting Children in Middle Childhood

- **Balancing Play and Academics** – Children continue to benefit from hands-on learning experiences. While academics become more structured, play remains a critical tool for engagement and understanding.
- **Encouraging Inquiry and Critical Thinking** – Children at this age ask complex questions and enjoy problem-solving. Encouraging curiosity through science experiments, discussions, and projects fosters deeper learning.
- **Promoting Social-Emotional Skills** – Role-playing, discussions about empathy, and guided peer interactions help children navigate friendships and emotional challenges.
- **Culturally Responsive Learning** – Introducing diverse stories, perspectives, and traditions in learning experiences fosters inclusivity and respect for differences (NAEYC, 2020).

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4.5: Play Based Learning

Learning Objectives

1. Explain how play-based learning supports children's development.
2. Differentiate between types of play (open-ended, guided, and structured).
3. Describe the role of the different types play in promoting development.

Play-based learning is a fundamental component of Developmentally Appropriate Practice (DAP), providing children with meaningful, engaging experiences that support their development as a whole. Through play, children explore the world, build problem-solving skills, develop creativity, and form social connections. High-quality early childhood programs and caregivers recognize that play is not separate from learning—it is the vehicle through which young children learn best (Ginsburg, 2007; Pica, 2011).

Research consistently shows that play supports brain development by creating neural connections that enhance cognitive skills. When children engage in hands-on, active play, they practice decision-making, reasoning, and perseverance, all of which are essential for academic and lifelong success. Unlike passive learning methods that focus on rote memorization, play-based learning encourages children to think critically and make discoveries on their own.

Social and emotional growth also flourish in play-based environments. Children learn to communicate and navigate relationships as they engage in dramatic play, group games, and collaborative projects. Play provides opportunities for children to practice skills in a natural and supportive setting. For example, when children take on roles in pretend play, they explore different perspectives and develop a deeper understanding of social interactions. This type of learning is essential for building emotional intelligence and preparing children for future social experiences.

Physical development is another area where play-based learning is essential. Active play strengthens both gross and fine motor skills. These movements are foundational for later academic tasks such as writing, cutting, and using technology. Additionally, active play promotes overall health and well-being by encouraging movement and coordination (Pica, 2011).



Figure 4.5.1. Play-based learning. Image by Province of British Columbia is licensed CC BY-NC-ND 2.0

Play-based learning takes many forms and should be intentionally planned to support children's development. **Open-ended play**, where children have the freedom to explore and create, fosters imagination and problem-solving. **Guided play**, in which caregivers and educators introduce materials or ask thought-provoking questions, helps extend children's thinking while still allowing them autonomy. **Structured play,** such as games with rules, helps children develop patience, turn-taking, and strategic thinking. A balanced approach that incorporates all types of play ensures a rich and engaging learning environment (Ginsburg, 2007).

Despite its proven benefits, play-based learning is sometimes undervalued in favor of more formal academic instruction, particularly in early childhood settings. However, research confirms that young children learn foundational academic skills more effectively through play than through direct instruction alone. For instance, children develop early math concepts by sorting objects, recognizing patterns, and measuring materials during play. Similarly, language skills grow as children engage in storytelling, role-playing, and discussions with peers and caregivers (Hirsh-Pasek et al., 2009).

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CHAPTER OVERVIEW

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5.1: The Role of Observation

Learning Objectives

1. Define observation.
2. Explain the significance of observation in understanding child development and supporting intentional teaching.
3. Describe the various purposes of observation in early childhood settings, including curriculum planning, safety checks, assessment, and family communication.
4. Identify ways in which observation informs developmentally appropriate practices and supports diverse learners.

To provide children with a safe and nurturing learning environment and to maintain program effectiveness, professionals must incorporate observation, documentation, and assessment into their daily routines. To be truly effective, professionals must develop skills and strategies grounded in best practices.

Throughout this book, the "you" is considered either the observer and/or the teacher. You might be reading this book as a student taking an observation class at a college or university. "You" might be a teacher working in a classroom with young children, from zero to eight years old. "You" might be a professional working with young children in other capacities. In addition to being a professional, “you” might also be a student taking other college-level classes. In other words, you are wearing two hats at once. So, the terms professional and observer used throughout this chapter can be considered interchangeable depending on your role in the observation process.

What is Observation?

Observation is defined as “the process of gathering information about objects and events using senses of sight, smell, sound, touch and taste, noticing specific details or phenomena that ordinarily might be overlooked” (CDE, 2016 p. 64).2 According to Bentzen (2009) observation is “the ability to take in information through one or more of the five physical senses and to make sense of that information so that it can me used in meaningful ways” (p.4).

The Role of Observation

Observations are conducted every day in early childhood environments. Professionals are constantly surveying the environment and conducting safety checks to ensure the equipment and materials are safe for children to use. Professionals also perform daily health screenings to ensure their children are healthy enough to participate in program activities. Beyond the standard safety check and health screening, professionals have many other important tasks and duties that they must do to maintain a calm classroom environment.

Intentional professionals use their observations to plan and implement curriculum, set up engaging learning environments, monitor the children’s social interactions, track behaviors, communicate with families, and assess each child’s progress and development. Essentially, observations help professionals be more accountable.

By conducting regular observations, intentional professionals can:

1. Make improvements to ensure quality practices
2. Plan and implement a developmentally appropriate curriculum
3. Measure and assess a child’s development
4. Evaluate program effectiveness
5. Evaluate teacher effectiveness
6. Develop respectful family partnerships
7. Understand the cultural practices and family structure
8. Select effective learning strategies to support and accommodate the diverse needs of children
9. Ensure ethical conduct and professional standards of practice
10. Teach with confidence

If we want to understand children, we must first watch them and listen to them. Then, we must try to make sense of what we observed and give it meaning. The role of observation is to provide professionals with information and evidence that they will need

to make informed decisions on how to best support the children in their care. With each observation, you will get a glimpse into a child's developing mind. Not only will you see a child's personality emerge, but you will also be able to see what a child can do. As you watch children, you will see how they problem-solve when conflicts arise and how they cope with the stress of being in a group setting. You will learn about their individual needs and their cultural practices. When you watch children closely, their interests and abilities are revealed. With each observation, you will gain valuable insight that will help you become more intentional.

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5.2: Becoming a Skilled Observer

Learning Objectives

1. Explain the importance of being present and attentive during child observations to capture meaningful behaviors and interactions.
2. Describe how foundational knowledge of child development informs observation, planning, and interpretation of children's actions.

To truly observe a child, you must be present, knowledgeable, inquisitive, and intentional. With every observation, you will sharpen your skills as you learn how to gather objective evidence and detailed data effectively.

Be present

To capture all the individual mannerisms, subtle social nuances, nonverbal body language, and dynamic conversations that occur throughout the day, you must be attentive, focused, and ready at any moment. Children move fast. When we blink, we are bound to miss some little detail or precious moment, that's a given. Being present takes considerable effort and careful planning.

Be knowledgeable

Understanding the core concepts of early childhood education is crucial if you want to set reasonable expectations and plan developmentally appropriate learning experiences. Familiarizing yourself with child development theories will help you understand and appreciate why children behave the way they do. Learning about the key principles in early care and education will provide you with a solid foundation and a wide range of instructional strategies to support a child's development.

Be inquisitive

Think of yourself as a researcher. Your primary mission is to investigate the children in your care by routinely gathering evidence, using a variety of observation methods and tools. As a good researcher, you will need to ask some thoughtful questions. These questions will guide you as you plan purposeful observations and choose your method of observation. Here are some sample questions you may ask yourself: What activities interest Max? How many times did Stevie hit today? What skills did Hazel master today with this activity, and what skills need further support? How long did Zoey stay engaged while playing in the sandbox? What milestones will this activity support? By asking thoughtful questions, you will learn more about the children in your care and do a better job of supporting each child's individual needs. Rather than fixating on a child's behavior, over time, you will begin using focused observations to try to figure out why a child acts the way they do.

Be intentional

As you organize learning experiences, set up the classroom and outside environment, assess children's developmental progress, engage in activities, and interact with your children and families – you must have a thoughtful plan of action in place. "Intentional teaching means that everything you do as a teacher has a specific goal and purpose" (Gordon & Browne, 2016 p. 103). Even as spontaneous situations arise, intentional teachers must make the most of teachable moments. Intentional teachers conduct regular observations and gather objective documentation data to be accountable for the actions they take, the plans they generate, and the assessments they make.

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5.3: Observations Can Be Spontaneous or Planned

Learning Objectives

1. Differentiate between spontaneous and planned observations.
2. Identify the advantages and limitations of spontaneous observations.
3. Reflect on how both types of observations contribute to understanding children's growth and learning.

Spontaneous Observations

Spontaneous observations occur all the time. Whether professionals are actively engaged with their children during an activity or in the background cleaning up after it, they have numerous opportunities to see and hear some wonderful developments as they occur. According to Piaget, children require long, uninterrupted periods of play and exploration so that they can discover things for themselves. If we truly believe that children are capable of socializing, problem-solving, and creating complex systems with rules, then we can successfully use spontaneous observations to capture a child's development as it unfolds naturally.

Figure **5.3.1**: Older infant crying while older brother watches. Image by Heather Carter is licensed CC BY-NC-SA 4.0



Figure **5.3.2**: Older brother responds by kissing crying infant's forehead. Image by Heather Carter is licensed CC BY-NC-SA 4.0



As intentional professionals, we can also appreciate when teachable moments arise unexpectedly. These golden moments are noteworthy as well. For example, when we witness a child attempting to master a milestone, we may provide verbal support or guidance to scaffold their learning. For example, when Abraham is becoming frustrated with not being able to get a piece of his puzzle to fit, a teacher might ask, "What happens when you turn the piece around?" During spontaneous situations, we must remember to simultaneously make mental notes so that we can later write down and reflect on a more formal plan of action that can be later used to help the child achieve their developmental goals.

Let's review the advantages and disadvantages associated with spontaneous observations.

Advantages

Being in the moment allows you to enjoy your children, and children appreciate your presence. When you are present, you can celebrate a child's success or provide positive reinforcements to help them master major milestones. While being spontaneous, you can focus on the child's interests and pose thoughtful questions to extend and enrich their learning experience. When a professional keeps a low profile, a child is less likely to be self-conscious or nervous.

Disadvantages

The longer you wait to document your spontaneous observation evidence, the harder it will be to remain objective and recall the vital details which is important when tracking behaviors or assessing development. Also, the more time that passes, the more difficult it will be to access accurate data. For example, by not documenting the children's dialogue or capturing their key quotes in a timely manner, you may find it difficult to remember their actual word choices and use of vocabulary, which is essential for assessing a child's expressive language development.

Planned Observations

Let's now discuss focused or planned observations. Becoming a skilled observer takes practice. At first, you may be slightly overwhelmed with trying to incorporate an official observation time into your already busy schedule. You may struggle with finding that delicate balance between knowing when to interact with the children and realizing when to step back and observe. Once you do observe, you might be surprised by the amount of evidence you have collected on each child. What's more, you will have to sift through all the evidence, and that can be both time-consuming and exhausting. Since your time is limited and you can't possibly observe everything, incorporating a planned observation will help you navigate your busy day and gather more specific evidence (James & Gronlund, 2013).

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5.4: Questions for Consideration

Learning Objectives

1. Identify appropriate times and settings for observing children.
2. Explain the importance of using multiple observation methods and tools to capture diverse aspects of child development.
3. Recognize the need for equitable and unbiased observation of all children to support inclusive and respectful learning environments.

When Should I Observe?

From the moment a child walks into their learning environment, until the time they leave, opportunities to learn are occurring. Some observations will happen spontaneously, while others will be scheduled. To see a child's full potential, you will need to observe at various times throughout the day. For example, some children are slow to warm up, and it may take them some time to get acclimated before they can fully engage and interact with others. If a child is slow to warm up, the morning drop-off may not be the best time to document their social development. You will want to track them throughout the day, at various times (including transition times and snack/meal times), to get a full picture of who they are and what they can do.

Where Should I Observe?

Many times, observations are centered around structured, teacher-directed activities. This is a perfect time to witness what major milestones a child has mastered. However, observing a child while they explore in the dramatic play area (inside) or the sandbox area (outside) can prove just as enlightening. During child-directed play or open exploration, you will no doubt be able to document many of the developmental skills as suggested in the DRDP or Rating Scales, especially how they communicate, cooperate, solve dilemmas, and create. Because children can play and learn differently inside compared to outside, it is necessary to observe them in both environments. Likewise, it is important to observe in all activity areas and play spaces.

What Observation Method Should I Use?

Use a variety of methods to record and document your children. You will want to "try out" several tools and techniques to find your "go-to" method. Because each tool has a specific purpose or focus, using a variety of methods will provide you with sound documentation data to better understand the whole child's development. Note: In the next chapters, you will examine the various tools and techniques more closely.

Who Should I Observe?

You will want to observe each child as an individual and track group interactions. Becoming aware of who is in your class is necessary if you are going to create a caring classroom community and a respectful learning environment. Look for those who are leaders in your group; find out who needs more one-on-one support and who are your helpers. Watch who plays with whom. This insight can help you organize peer scaffolding opportunities, which can free up some of your time.

As a gentle reminder, sometimes we connect with certain children for one reason or another, and other times, a child may challenge us. Either way, we need to regularly observe each child with an open mind and an open heart, and we need to look at children through a clear lens that is free of bias. Each child needs your attention; each child has unique gifts; and each child needs your support.

What is the Focus of My Observation? What Am I Looking For?

With focused observations, there is usually a specific goal in mind. For example, you might want to know what milestones a child has mastered. For that, you would use a developmental checklist to "check off" all the skills the child was observed doing. Maybe you want to learn what the child's interests are and what they like to play with. For that, you can use a frequency count to tally up all the areas and activities the child used during that observation. Keep in mind that you can observe several skills and competencies across multiple domains during one observation. For example, one day you might set out a math activity and the children are expected to create patterns using colorful beads and pipe cleaners, While they work and play, you can listen to the children's conversations as they describe the patterns they are making; and you can note their fine motor development based on

how well they string the beads onto the pipe cleaner; you can also see how they shared space and materials with their peers. Although this was a math activity, many other areas of development can be observed.

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5.5: Factors that Affect Observation

Learning Objectives

1. Identify personal and environmental factors (e.g., fatigue, bias, setting) that may influence the accuracy of child observations.
2. Explain how sensitivity, self-awareness, and professional reflection impact observational objectivity.
3. Describe the three common observation errors: transmission, omission, and commission.

Factors that Affect Observation

Observation is not an easy task. It would be best if you considered personal and environmental factors that can affect your ability to observe young children effectively. These factors can be temporary, like not feeling well, or more long-term, like a bias. Bentzen (2009) lists five areas that can affect your ability to observe in a learning environment:

1. **Sensitivity and Awareness**- certain things will interfere with how you "see" the child. Some of us are more sensitive to certain things than others. Being aware of your sensitivity is essential to ensure accurate observations are being recorded.
2. **Fatigue, Illness, and Discomfort**- These factors can affect your ability to stay on task. You can become distracted and lose focus on what you are observing.
3. **Influence of Self or Personality**- Sorting out "you" from what you view. Individual attitudes, experiences, needs, desires, and fears act as filters that affect how you observe and what you notice when observing.
4. **Controlling Our Biases** - Be aware of your biases. We all have them, so being aware of your biases can help you manage them. Be mindful of your favorite children and children who display behaviors that challenge you. These children can cause us to lose our objectivity when recording observations.
5. **Setting and Situation** - These are factors that you generally have little control over. A particular situation occurs in a setting. The setting is both the physical space and the social and psychological influences in a specific location. The size of the room can make it difficult to hear a child across the room. If there are drums in the music area, it can also be difficult to hear conversations. There is also a difference in children on a rainy day versus a windy Santa Ana day or a substitute teacher.

Errors in the Observation Process

There are three common errors in the observation process: **transmission**, **omission**, and **commission** (Bentzen, 2009). It is crucial that you know and understand these errors to record objective observations of the children. These errors occur in the recording process.

Transmission

The first and most common error is an error of transmission. This is when you record behaviors out of sequence. For instance, you observe a child in the block area pick up a block and hit another child. What happened is that the other child called the child who hit a "big bad guy." This happened just before the child picked up the block and hit the child who called them the name. In your observation, you record the following: "__ picked up a block and hit __ in the block area. __ called ___ 'big bad guy,' and the teacher came over to tend to the hurt child."

The name-calling should have been stated before the block hitting. This is an example of the error of transmission.

Omission

The second error in the recording process is the error of omission. This is when you leave out important information. This can happen when you are not carefully observing, coming onto the scene halfway through, or looking down as you are writing out the first part of the observation.

This error often occurs due to weak note-taking. It is difficult to observe and record at the same time. The more you observe and record, the more your skills will improve.

If you don't have enough information, you may not want to record the observation. If we go back to the example above with the child who hit with a block and the child who called the other a name, an error of omission can be recorded like this: "___ said something to ___, and ___ picked up a block and hit them with it." The word "something" is omitting exactly what the child called the one who was hit.

Leaving out "big bad guy" could prompt the reader to think the child who was hit was the instigator when, in reality, the name-caller is the one who provoked the child who hit.

Comission

The third error in the recording process is the error of commission. This is when the observer adds more to the observation. The observer may "think" something happened in one way and record "their version" instead of what actually happened. Another instance might occur when an inexperienced observer adds more to the observation because they think the director or parent will want more information. Using the same example, the observer will make the error of commission by recording the following observation, "___ was sitting in the block area playing with the blocks. __ was playing with a car and driving it all around the block area. At one point, ___ said to ___, "You are a big bully, and I don't like you. You are a big, bad guy." ___ picked up a block and hit ___ with it. If the child didn't say all of this, as the observer, you do not record what you think the child said. You only record what you heard and observed.

These three errors often occur, especially for the person just learning how to observe. It's important to remember to record only the facts, nothing but the facts! The more accurate you are in recording your observations, the more it will benefit the child.

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5.6: Objective vs. Subjective

Learning Objectives

1. Differentiate between objective and subjective observations.
2. Analyze personal biases and their potential impact on remaining objective during observations.
3. Identify strategies to minimize bias.

Intentional professionals must learn how to write objective observations. As you observe, it is best to write down all that you see and hear, and report just the facts. It takes practice to learn how to distinguish between facts and opinions. Here are some helpful tips for you to review:

Table **5.6.1**: Objective vs. Subjective Observations

Objective Observations	Subjective Observations
Objective observations are based on what we observe using our senses; we record exactly what we see, hear, taste, touch, and smell.	Subjective observations are often influenced by our past events, personal experiences, and opinions, and can be biased based on our cultural backgrounds.
Objective information is based on the facts we gather. If we don't see it, we don't report it. We report only details and provide vivid descriptions.	Subjective information is based on our opinions, assumptions, personal beliefs, prejudiced feelings, or can be based on suspicions, rumors, and guesses.
Results are more likely to be valid and reliable from child to child.	Results are often inconsistent and vary from child to child.
Objective Terms that can be Used: Seems to be, appears to	Subjective Words to Avoid: Just, because, but, always, never, can't, I think, happy, smart, helpful, pretty, angry, shy, likes, loves, hates, sad

Recognizing Your Biases

Google the word bias, and this is what pops up: "prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair."

Biases, we all have them. Biases stem from our upbringing. Every interaction and every experience we have had has shaped who we are. To some degree, our biases influence our beliefs and behaviors, sway our attitudes, and affect our personalities. Because our biases are so ingrained into who we are, it would be unrealistic to simply say "ignore your bias." Therefore, a valuable exercise might be to do a self-check and examine your own biases. Look for those biases that are "triggers." More specifically, think about the behaviors, temperamental traits, and moods that make you feel uncomfortable, frustrated, or annoyed.

It is important to note that we may not be fully aware of all our biases. For example, when a child says, "Give me some milk!" Our first response might be "Ummm, how do you ask?" We might not realize that manners (or lack of them) can make us react in a judgmental way. What's important to recognize is that how we feel about the child's behavior can taint how we see them. What's more, our biases can influence how we gather our observational evidence. As intentional teachers, we have to recognize our biases so we can treat all children with the respect that they deserve. According to NAEYC's Code of Ethical Conduct and Statement of Commitment (2011),

> *P-1.3—We shall not participate in practices that discriminate against children by denying benefits, giving special advantages, or excluding them from programs or activities on the basis of their sex, race, national origin, immigration status, preferred home language, religious beliefs, medical condition, disability, or the marital status/family structure, sexual orientation, or religious beliefs or other affiliations of their families (p. 3).*

So as not to lose our objectivity, it is important to keep an open heart, an open mind, and a clear lens. Rather than letting a child's behavior trigger you, look beyond their behavior, look beyond your bias. Focus on collecting objective observation evidence and use that data to reflect on what might be causing that behavior. Consider ways that you can support the child through redirection,

modeling, scaffolding, or positive reinforcement. As intentional professionals, one of our primary roles is to empower children and to build meaningful relationships by creating warm, caring environments (Epstein, 2007).



Pin It! Common Mistakes to Avoid When Writing Observation Evidence

- **Making Conclusions:** Billie can't do anything by himself ***because*** he is the youngest in a large family, and they do everything for him; Sharon's parents are getting a divorce, ***so she is sad***
- **Making Assumptions:** Annie ***never*** shares; Denise ***always*** hits Thomas
- **Labeling:** Rosie ***is mean***; Jeff is such a ***good boy***
- **Comparing:** Tommy ***can't*** ride the bike ***as well as*** Sam; Zoey was ***the best*** listener at circle time
- **Focusing on Feelings or Emotions:** Max looks so ***sad*** today; Jax looks s***o happy*** as he slides down the slide
- **Adding Opinions:** Martha ***really likes*** playing dress up; she is in the dramatic play area every day. Suki ***is shy*** and never says anything during circle time.

References, Contributors and Attributions

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- **10: Middle Childhood - Physical Development** by Paris, Ricardo, Rymond, & Johnson is licensed CC BY 4.0. Original source: https://open.umn.edu/opentextbooks/textbooks/child-growth-and-development.

5.7: Interpretation and Evaluation

Learning Objectives

- Explain the distinction between observation, interpretation, and evaluation.
- Identify how to separate objective observations from interpretations and evaluations.
- Describe the importance of making multiple observations before forming interpretations or evaluations.

As humans, we interpret the world around us each minute we are awake. For instance, have you ever sat on a park bench and "people watched"? Of course, we have all watched other people interact while we sat by and made our own interpretations.

Interpretation

Interpretation means going beyond our own objective descriptions and explaining or giving them some meaning (Bentzen, 2009). For instance, if you were sitting on a park bench and saw an elderly woman fall and the person next to them helped pick them up, you might interpret that observation to yourself: "That person is very kind and caring. Not everyone would have wanted to get involved and help that woman." This is an example of interpreting an observation.

Another way of thinking about interpretation is to add an explanation. If you think about interpretation/explanation together, you can expand the definition to a way to attempt to provide additional information that might make your objective descriptions more meaningful (Bentzen, 2009).

If we go back to the example where the elderly woman fell, and your interpretation was that the person who helped her up was "kind and caring," do you know if this person was kind or caring? Not really.

You observed the person who helped in one situation. You cannot create an accurate interpretation after only one observation. To accurately interpret a person's ability or inability, one must observe multiple times in various situations before making any interpretation or explanation.

Observing young children more than once is required before you, as the observer, can accurately interpret or explain the child's behavior. If you interpret too early before you have made multiple observations, you could very well be mistaken. This mistake could lead to a faulty evaluation.

Evaluation

Evaluation is a very dangerous part of the observation process. This is where the observer applies their values and attitudes to the child's behaviors, characteristics, and personality (Bentzen, 2009). The evaluation process is a time when labels can be thrown out when discussing the child's behavior.

Labels can be damaging to the child and family. For instance, if you observe a four-year-old child during the first week of school and label the child "unwilling to participate," you could be judging the child without all the facts. Separation anxiety is very common in the first weeks of school for a young child, especially if this is the first time they are in a group care situation. A label of "unwilling to participate" was made too hastily, and the child was not given enough time to adjust to the new situation.

As you observe young children, you will need to interpret and evaluate their behaviors. Interpretations and evaluations must be made after multiple observations have been recorded on the child. Then and only then, the observer must separate the objective description of the behavior from the interpretation/evaluation (I/E). There are multiple ways to format your observations to keep objective descriptions separate from interpretation/evaluation. One of the easiest ways is to include the interpretation/evaluation right after the observations.

Example 1

The following chart gives an example of how to keep observations and I/E separate:

Name:	Teacher:	Date:
Age:	Domain of Dev:	Time:
Setting:		
Situation:		

Observation:

Interpretation/Evaluation:

"Chart for Keeping Observations and I/E separate". by Peterson et.al., 2020. Accessible version found on page 20.

Example 2

Another example could be to use two boxes:

Observation	Interpretation/Evaluation
Keep observational notes on this side.	Use this side for the interpretation/evaluation of the observation.

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5.8: Observation and Documentation Do's and Don'ts

Learning Objectives

1. Explain the ethical responsibilities of observers.
2. Identify how observation may influence children's behavior.
3. Describe strategies for minimizing intrusion during play and learning.

Ethical Guidelines When Observing Children

Every day, teachers observe, record, and capture essential moments in a child's development. The evidence and artifacts gathered are then used to plan the curriculum and assess development. Although we have highlighted the importance of gathering work samples and observational evidence as a key element of being an intentional teacher, we must also consider the child's perspective. In the article "Who is Watching? Thinking Ethically about Observing Children," the authors highlight some of the ethical tensions that can arise in early childhood settings when trying to balance the rights of children, the responsibilities of teachers, and the role of a student training to be a future teacher.

In most classrooms, a typical day includes teachers grabbing their cameras to take photos of the children in their care, so they have ample documentation. Consider this - does the teacher's presence change the context of the child's experience? Does the thought of being monitored make the child behave any differently? How does the child feel about having their picture taken? Are teachers becoming overly concerned about capturing children in precious moments, rather than being engaged in teachable moments?



Figure 5.8.1."Observing the world through a different lens". Image by Andrew Seaman on Unsplash.

As a "student" who is learning to observe and document a child's development, it is important to consider the following guidelines when observing children:

- Take every precaution to maintain confidentiality and to ensure privacy
- Remember to ask if it is OK to take photographs of children and their work
- Understand that children have the right not to take part in activities
- Be respectful and keep a reasonable amount of space between you and the child so as not to interfere with their play and learning
- Be attuned to children's body language, temperament, and styles of communication
- See each child as a unique individual who has their own perspective, set of feelings, interests, and way of socializing, along with their own cultural context, belief system, and values
- Be upfront and inform children about the purpose of your observation visit if you are approached
- Share information with the child about what you have observed when appropriate
- Write quotes down just as they were said, without adding context, or trying to rationalize what the child may have meant
- Be aware that photos and observation data should be collected in a non-intrusive manner
- Ensure that observation evidence and photos are used only for the purposes intended
- Handle photos and data with care and sensitivity, and always store information securely
- Realize that a child's reactions, behaviors, and conversation may not be what you expect, and therefore, you should refrain from being judgmental or tainted by your cultural biases

By following these guidelines, you are providing the children you observe with the respect they deserve while ensuring their dignity and safety. The centers and programs where you are observing trust you to act with integrity while you are on their site, observing their children. Lastly, families will appreciate that you have their child's best interests at heart.

Do's and Don't's of Observation and Documentation

Whether performing a planned or spontaneous observation, here are some helpful tips to ensure you are recording quality evidence:

Table 5.8.1. Observation and Documentation DOs and DON'Ts

Observation and Documentation DOs:	Observation and Documentation DON'Ts:
Note the date, time, setting, and situation	Do not interfere with or pressure the children to perform
Note the child (or children) involved and their ages	Do not assume or state your opinion while recording evidence
Record only the facts – in a concise (to the point) manner	Do not record anything you do not see
Record the facts in the order as they occur and exactly as you see them	Avoid making the errors of transmission, omission, or commission
Collect vivid details and quotes	Do not label behaviors, actions, or feelings
Use a variety of observation methods	Avoid using subjective, biased, or judgmental terms
Observe with an open heart, an open mind, and a clear lens, free of bias	Avoid using exaggerations and conditional words
Be attentive and alert, and use all your senses	Do not summarize information
Note what the child CAN DO rather than what he cannot do	Avoid using generalizations or vague terms
Keep a low profile and respect the children's space while they are playing	Keep interpretations and evaluations separate from the actual observation

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SECTION OVERVIEW

5.9: Types of Observations

No single observation can give you all the information you will need about a child's development. In order to truly understand a child's unique attributes, preferences, personality and strengths, you must observe them consistently, using several documentation tools and techniques. Each observation method has strengths and limitations.

Topic hierarchy

5.9.1: Checklists

5.9.2: Rating Scales

5.9.3: Frequency Counts

5.9.4: Time Sampling

5.9.5: Anecdotal Records

5.9.6: Running Records

5.9.7: Work Sample

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5.9.1: Checklists

Learning Objectives

1. Describe the purpose of developmental checklists.
2. Identify how checklists are used to document children's skills across developmental domains.
3. Compare and contrast open-ended and closed-ended checklists.
4. Explain the advantages and limitations of open-ended vs. closed-ended checklists.

What Are Checklists?

Checklists are an efficient and practical way to collect information about a child's development. Checklists are based on "developmental norms". There are certain expectations and skills that a child should be able to achieve at each age range. Checklists are designed to track a child's competencies in all the developmental domains, including physical, cognitive, language, social, and emotional. With a Checklist, professionals can easily see what a child can do and note what areas of development need further support.

Checklists can be either open-ended or closed-ended, depending on the amount of raw data, or observation, that is written for each indicator or category listed on the Checklist. If the Checklist is merely a mark on the paper with a checkmark, or an "X", then the Checklist is closed-ended. If the Checklist requires a comment or an Anecdotal Record to accompany the checkmark, then it is open-ended.

Advantages and Disadvantages

Table **5.9.1.1.** Advantages and Disadvantages of Checklists

Advantages	Disadvantages
Ideal for tracking a child's progress over time	Checklists do not provide rich details or context like anecdotal notes or running records
Different observers (the teacher, assistant, or a support team) can check off skills that they observe the child doing	There is no clear sequence of events regarding certain actions or behaviors
Checklists can be created to measure specific areas of development, or a subset of developmental skills	Checklists focus on developmental norms and typical development with no regard for environment, family influences, cultural influences, and individual development
Checklists can be used to observe a group of children or an individual child	Teachers tend to focus on the skills and milestones that haven’t been mastered, focusing on the deficits rather than highlighting the strengths. This can make the child and parents feel as if they have failed,d or add unnecessary stress
Checklists are quick and easy to use, and no training is required	Checklists must be updated regularly using other observation methods
Checklists can be used in conjunction with other observations	
Checklists highlight the developmental strengths a child has mastered, as well as those skills that need further support	
Developmental Milestone Checklists are readily available online through various agencies (i.e. Centers for Disease Control)	
Data can help plan curriculum activities	

When to Use Checklists

Checklists must be created ahead of time, requiring a great deal of structuring. Creating a valid Checklist is difficult. It can be done, but developing and validating a Checklist is hugely time-consuming. So, in other words, use one that has already been created and verified. Why reinvent the wheel?

As far as selectivity, it depends on the categories listed on the Checklist. Since you are looking for specific behaviors, Checklists are considered selective. As an observer, you must judge if the behavior you want to observe fits into the definition listed on the instrument.

Collecting Data

Whether you design your own Checklist or download one, use it regularly to collect data. The Checklist can be utilized in two ways:

1. You can observe a child on a specific day while engaged in an activity (either child-directed or teacher-directed). As you observe, you will check off the skills or milestones that the child can do on that day, at that moment.
2. You can also review data from other observations (e.g., running records or anecdotal notes, work samples) that you collected, and ADD any other skills or milestones that were mastered during those previous observations.

*Note: You must note the dates you observed the skills being mastered. A checkmark alone will limit the reliability and validity.

Organizing Data

Schedule a day and time to review your observation data regularly. Data collected from other observations (mastered milestones and developing skill sets) can be added to the Checklist so you can see a child's progress. You may use colored pens to track the dates on which milestones were achieved. As you review the Checklist, what can you interpret from this data? Does the child demonstrate strengths in any of the developmental domains or areas of learning? Which milestones and skills need further support? As you consider those questions, reflect on a plan of action that you might use to further support that child's development. How can you provide opportunities for the child to gain more practice? What adjustments need to be made to make the activity more challenging? What extensions can be added to continue the learning pattern (Head Start ECLKC, n.d.).

Checklist Example

Checklist for Physical Milestone
Perceptual Movement

Skills	Can Do	Needs Further Support	Date and Evidence
Moves in a zig-zag pattern – able to change directions with ease			
Plays follow the leaders and mirrors others movements			
Moves body to music cues			
Speeds up and slows down while running or riding bike			

Figure 5.9.1.1. For original work, please see page 61.

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Head Start ECLKC. (n.d.). Using Checklists Highlight Video. Retrieved from https://eclkc.ohs.acf.hhs.gov/sites/...ight-video.pdf

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5.9.2: Rating Scales

Learning Objectives

1. Define what a rating scale is.
2. Explain how a rating scale differs from other observation tools such as checklists.
3. Identify appropriate uses of rating scales.
4. Evaluate the advantages and limitations of rating scales, including the role of observer inference and the importance of clear behavioral categories.

What is a Rating Scale?

Rating Scales share similarities with Checklists. When we rate something, we assign it a value or quality (Bentzen, 2009). Has this ever happened to you? When you go to the store and make a purchase, the cashier hands you a receipt, circles the code at the bottom, and asks you to rate the service you received during your visit. Organizations, like Consumer Reports, rate everything from refrigerators to cars to laundry soap. As a consumer, you look at the product ratings you want to purchase and hopefully make the best decision based on quality, functionality, and price. The term "scale" is a little more challenging to define. According to Bentzen (2009), “a scale is simply an instrument with which to measure or record the relative degree to which children possess certain skills, abilities, behaviors, personality, characteristics, and so forth” (pg. 210).

When we combine the two terms, Rating and Scale, we have a method of observation. We are distinguishing the differences among various categories of development demonstrated by the child through their skills, abilities, behaviors, etc. Rating Scales consist of rating or assigning a value or quality to a behavior. This is another method where no raw data is collected (no words, only the length of time). With no raw data collected, Rating Scales are one of the most closed-ended observation methods. Since you are observing only a particular category of behavior, Rating Scales are highly selective. Clearly defined categories of behavior are essential for the professional to know where to place the mark on the continuum line. Then, inference is used on the part of the observer when you decide where to place the mark on the line. As an observer, you must judge if the behavior fits the category listed on the continuum.

When to Use a Rating Scale

Rating Scales are good tools when you need to measure the intensity, frequency, or quality of a child's behavior or skills. They also provide a way to document subtle differences in performance or progress, which might be missed with a closed-ended checklist. Rating Scales are also appropriate when you want to compare skills over time and see how skills trend in a more streamlined manner. They are also a good tool when asking families to be involved in the documentation process, as they can be fairly easy to complete while still aligning with developmental benchmarks or standards.

Advantages and Disadvantages

Table \(\PageIndex{1}\). Advantages and Disadvantages of Rating Scales

Advantages	Disadvantages
Quick and easy to use, and no training is required	Does not provide rich details or context, like anecdotal notes or running records
Can be used for classroom planning purposes, either for individualizing with a child or for the whole group	No raw data is collected
Provides an opportunity to compare development at multiple points during the year	Results may be misleading
	Observer bias can affect the ratings due to the high level of inference involved in rating the child
	Categories for rating must be clearly defined for the observer to reduce errors

Collecting Data

Collecting data for a Rating Scale is rather easy. Making a mark on a line is about as easy as it gets. Of course, where to make the mark on the line is extremely important. You must be accurate in your rating based on your previous observations. Below is an example of one category of behaviors (communicates with peers). An example of a Rating Scale could be their degree of communication with other children. A Rating Scale might look something like this:

Communicates with Peers: (October rating)

	X				
Seldom communicates with peers		Communicates by initiating conversation with peers			Frequently engages in 2-way conversations with peers

Example from the Palomar College Child Development Center Social Attitudes and Maturity Rating Scale

Figure 5.9.2.1. Example Rating Scale of communication initiation with peers as rated in October. For original work, please see page 64.

The X (in between "seldom communicates with peers" and "communicates by initiating conversation with peers") indicates that the professional observed the child's development when communicating with peers in the classroom during the month of October, when the rating was recorded.

Both professionals and parents can see the child's development over time by recording the observed data on the Rating Scale. You gather all of their previous observations and mark the scale where, to the best of your ability, the child's development is present during this rating period (October). As one observes the child over the year, the second rating might use XX as the symbol and be rated in May. The second rating might look like this, indicating where the child frequently engages in 2-way conversation with peers.

	X				XX
Seldom communicates with peers		Communicates by initiating conversation with peers			Frequently engages in 2-way conversations with peers

Example from the Palomar College Child Development Center Social Attitudes and Maturity Rating Scale

Figure 5.9.2.1. Example Rating Scale of communication initiation with peers as rated in May. For original work, please see page 64.

It is possible to create a Rating Scale. It is important to define the behaviors, skills, attitudes, and personality clearly… to be rated. For this section, we will refer to behaviors as a term to include any from this list. A fundamental Rating Scale lists categories as yes/no/sometimes. In the above example, only three items are rated along a continuum (a line showing a range of behaviors). The number of categories on the continuum can be three, five, or even up to seven. The problem with having too many items is that the observer can have difficulty distinguishing between the amounts or degrees of these categories. It is difficult to make fine distinctions between areas that can be too loose or too tight (Bentzen, 2009). For instance, what is the difference between excellent, very good, good, standard, below standard, poor, and unable to rate? We suggest no more than five categories per item to be rated.

The categories of behavior rated can be listed from high to low or low to high. The example above lists low-end behaviors displayed by younger children and high-end behaviors presented by older children. No matter the direction you choose to rate the behavior, the creator of the Rating Scale must be consistent in direction (either low to high or high to low) or rating if more than one behavior at a time is included on the Rating Scale.

Organizing Data

Organizing your data for a Rating Scale should be done when organizing the child's observations. Since Rating Scales do not document raw data, you will use your previous observations to select which behaviors you will rate. As you review the Rating Scale, consider the following:

- What can you interpret from your observations to rate?
- Does the child demonstrate strengths or areas of need in any developmental domains or areas of learning?
- Which milestones and skills need further support?

As you consider those questions, reflect on a plan of action that you might use to support that child further. How can you provide opportunities for the child to socialize more? What adjustments need to be made to the learning environment?

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5.9.3: Frequency Counts

Learning Objectives

1. Define frequency counts.
2. Explain how frequency counts are used to track specific behaviors, interests, or play patterns in children.
3. Identify appropriate scenarios for using frequency counts.
4. Evaluate the strengths and limitations of frequency counts.

What is a Frequency Count?

A Frequency Count is an informal observation method used to gather information about a child's interests, social interactions, play patterns, and temperamental traits. As the teacher observes the children at play, a tally mark is made every time the noted behavior or action occurs within a set timeframe. Frequency Counts are also used to track undesirable or challenging behaviors, as well as ideal for positive behaviors.

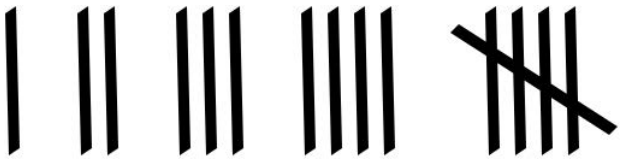


Figure 5.9.3.1. When is a frequency count used? Whenever you need to tally and record how often a behavior occurs. Image is in the public domain.

Frequency Counts are considered an informal method of observation. Frequency Counts consist of making a mark every time a behavior occurs, so no raw data is collected (no words, only marks). Frequency Counts are one of the most closed-ended observation methods, with no raw data collected. Frequency Counts are highly selective since you are observing only a particular event or behavior. The amount of inference is made when you decide if the narrowly selected behavior fits into your definition of the observable behavior. As an observer, you must make a judgment if the behavior fits into your definition or not.

When to Use a Frequency Count

As an observer, you must define, in advance, the behaviors you want to observe to tally with a Frequency Count. This method is used to get a baseline for behavior modification. Behavior modification is a way to increase positive behaviors and decrease negative behaviors (Marston, 2018). Behavior modification techniques focus on changing a person's environment in ways that increase the likelihood that certain behaviors will occur, with the overall goal of changing the behavior (Marston, 2018).

When using a Frequency Count to get a baseline for a child's behavior, the observer records every time the child demonstrates it. The teacher can change the environment once they find out how often the behavior occurs. After a period of adjustment to the new environment, the teacher will observe again using a Frequency Count. The goal is for fewer recorded behaviors on the second Frequency Count because the child's behavior has been modified or changed, so the child is not demonstrating the behavior that is being modified.

Advantages and Disadvantages

Table \(\PageIndex{1}\). Advantages and Disadvantages of Frequency Counts.

Advantages	Disadvantages
Quick and easy to use, and no training is required	Does not provide rich details or context, like anecdotal notes or running records
Can be personalized or designed to gather specific baseline data (play patterns, challenging behaviors, social situations, temperamental traits)	There is no clear sequence of events regarding certain actions or behaviors
Provides immediate, quantifiable data	(Although the behavior is tracked, information about the antecedent and the consequence is missing)
Ideal for tracking behaviors over time and for noting an increase or decrease in incidents	Does not provide qualitative evidence, and no raw data is collected
Can be useful when planning behavior modification strategies	Results may be misleading
Data can be graphed or charted to find consistent patterns	

Collecting Data

To create a Frequency Count, you must first decide what social interactions, behaviors, interest areas, or types of play you want to monitor. You may choose to track your child during one focused activity or timeframe, or you may map out what a typical day might look like for your child and follow all the interactions and experiences they engage in throughout the day. Either way, as you observe your child, you will make a tally mark every time they play in a specified area or display one of the action items listed on your Frequency Count.

Organizing Data

Count the tally marks after you have collected all the data for that timeframe. Since the data you collected (number of marks) is quantifiable, you can create a bar graph or a pie chart to share with other teachers or parents. What can you interpret from this data? What areas or action items received a high number of tally marks? What areas or action items received a low number of tally marks? Do you see any patterns? As you consider those questions, reflect on a plan of action that you might use to support that child further.

Frequency Count Examples

Example Situations

1. **Sue has been hitting a lot lately and displaying other challenging behaviors.** You will want to track **how** often she hits on a typical day and any other challenging behaviors. You will also want to track **where** the incidents occur – are there more incidents inside the classroom, or are things happening during outside play? You will want to look at **when** the incidents are happening most often– are there more incidents earlier or later in the day? You may want to observe **what** happens at drop-off, mealtime, and naptime. Lastly, you may want to track **who** Sue is socializing with and how she plays with others. Does Sue display a consistent play pattern (parallel play, cooperative play, or onlooker play)?
2. **Thomas is a new student whose mother wants to know how he is doing.** You may want to observe which centers Thomas visits most often throughout the day and track his interests. You may also want to track whether he plays alone or with other children.
3. **A child in your class is always challenging for you.** How can you create a supportive environment and provide a “goodness of fit?” You may need to track the child’s temperamental traits and observe how the child approaches activities and social situations.

Example to Track Areas and Interests

Frequency Count to Track Areas and Interests				
Child's Name:				
Observation Date:	**INDOOR CYCLE** **Start Time:** **End Time:**		**OUTDOOR CYCLE** **Start Time:** **End Time:**	
Areas and Interests	**Tally Marks**	**Total**	**Tally Marks**	**Total**
Art				
Blocks / Legos				
Library / Reading				
Dramatic Play				
Math				
Writing / Journaling				
Science / Nature				
Sensory				
Quiet Corner				
Computer Lab				
Music / Movement				
Climbing Structure				
Bikes				
Organized Games				
Super-Hero Play				
Rough and Tumble				
Running / Chasing				

Figure **5.9.3.2**. For original work, please see page 52.

Example to Track Play Patterns and Social Interactions

Frequency Count to Track Play Patterns and Social Interactions				
Observation Date:	INDOOR CYCLE Start Time: End Time:		OUTDOOR CYCLE Start Time: End Time:	
Play Patterns and Social Interactions	Tally Marks	Total	Tally Marks	Total
Solitary Play: Plays alone – does not seek out peer social interactions				
Parallel Play: Plays next to someone, using similar materials but did not directly interact				
Associative Play: Shares materials and talks to others while engaged in an activity				
Cooperative Play: Plays with peers in an organized manner with rules, taking turns				
Peer Interactions: Plays with Boys				
Peer Interactions: Plays with Girls				
Interactions with Teacher: Talks to teacher / shares ideas / asks for help				
Bystander: Is yelled at, hit or involved in an altercation / incident				
Instigates / Initiates Disputes: Hits, takes toys, yells at peers, causes an altercation / incident				
Problem solves: Communicated and resolved disputes without teachers help				
Teacher Interactions: Teacher needed to help resolve peer disputes / altercations				

Figure 5.9.3.3. For original work, please see page 53.

Example to Track Temperament and Behavior

Frequency Count to Track Temperament and Behavior				
Observation Date	INDOOR CYCLE Start Time End Time		OUTDOOR CYCLE Start Time End Time	
Temperament Traits and Behavior	Tally Marks	Total	Tally Marks	Total
Appears **Highly Active** – Rarely sits still, moves around, fidgets A LOT, races through activities				
Appears **Easily Distracted** Changes activities before finishing task / looks around a lot				
Appears Focused Completes tasks before moving on to the next task / can tune others out				
Reacts Intensely Has high emotional energy when reacting to others – yells/cries				
Remains Calm Able to transitions and go with the flow/does not react to altercations				
Appears Sensitive Squirms when touched, holds ears, squints, doesn't seem to like to touch certain textures				
Appears Cautious Hesitates or needs time to warm up to people and activities before joining in				
Appears to be In a good mood Smiles/ laughs often, cooperates with others and seems pleasant				
Appears Moody Has difficulty making transitions, displays highs and lows, rarely smiles when interacting with others				

Figure 5.9.3.4. For original work, please see page 54.

References, Contributors and Attributions

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5.9.4: Time Sampling

Learning Objectives

1. Define time sampling.
2. Describe how time sampling differs from other observational tools in terms of structure.
3. Identify appropriate scenarios for using time sampling.
4. Evaluate the advantages and limitations of time sampling.

What is Time Sampling?

Some behaviors children demonstrate appear more frequently. One method that teachers use to track frequent behaviors is Time Sampling. Time Samplings are completely different than the previously discussed Running Records and Anecdotal Records, where the observer describes the behavior. According to Wortham (2012),

> *The purpose of Time Sampling is to record the frequency of a behavior for a designated period of time. The observer decides ahead of time what behaviors will be observed, what the time interval will be, and how the behaviors will be recorded. The observer observes these behaviors and records how many times they occur during preset, uniform time periods. Other behaviors that occur during the observation are ignored (pg. 128).*

Time Sampling consists of observing and documenting how many times the behavior occurs using uniform times to observe. In most observations, the observer collects minimal or no raw data. Maybe a comment or phrase is documented, but not a detailed behavior description. With no or minimal raw data collected, Time Sampling is more closed-ended. Since you are observing only a particular behavior, Time Sampling is highly selective in nature. Behaviors and time intervals are predetermined. The amount of inference is made when you decide if the observed behavior fits into your definition of the categories on the Time Sampling. As an observer, you must make a judgment if the behavior fits the category definition or not.

Advantages and Disadvantages

Table 5.9.4.1. Advantages and Disadvantages of Time Sampling

Advantages	Disadvantages
There are no set restrictions for the types of behaviors to observe	The observer must create the Time Sampling before observing the child
Provides quantitative data over time and helps track changes in a child's behavior	It is not useful for infrequent behaviors
Multiple observers can use the same form to track a child's behavior	Observations must take place over a long period of time to get a representation of behavior
It is practical and easy to use	If no comment or raw data is collected, the sampling is merely a mark on a page and is less valuable over time
When the observer comments, the Time Sampling becomes more valuable over time	

When to Use Time Sampling

Time Sampling is very selective because you only observe a specific behavior during a set time. For instance, a teacher might want to observe a child's ability to stay on task. The teacher sets up a Time Sampling for Task and creates categories such as intent on individual work, attentive to other children, attentive to teacher, disinterested, aimless wandering, verbally disruptive, and physically disruptive (Bentzen, 2009). The observer observes the child once every three minutes for two hours. The teacher can set

a time to repeatedly vibrate in their pocket or watch every three minutes to remind them to observe the child's behavior and record what category of task the child is demonstrating at that time.

Collecting Data

Since there are so many variations for Time Sampling, you can create your own format based on the behavior and time intervals. It is important for the observer to observe for an extended period of time and designate enough time intervals to get a good representation of the child's behavior. To be a candidate for Time Sampling, the targeted behavior must be overt and frequent, occurring at least once every 15 minutes (Beaty, 2014). If you are unsure how often a behavior is demonstrated by the child, you might need to do some preliminary observations to see if Time Sampling is the right method for the targeted behavior.

One observable behavior, where a Time Sampling can be used, is to determine the number of times a child participates in various play categories. Mildred Parten developed the Six Classifications of Play or Social Interactions that young children participate in throughout their day. These Six Stages consist of the following:

1. Unoccupied Behavior- the child is not engaging in an activity or social.
2. Onlooker Behavior- most of the time the child watches other children play.
3. Solitary Play- the child plays alone and independent of what other children or adults are doing.
4. Parallel Play- the child is playing close to other children, using the same types of toys or materials, but not interacting with the other child/ren.
5. Associative Play- the child plays with other children, sharing materials, but no one in in control or in charge of the group.
6. Cooperative Play- the child plays in an organized group, where there are leaders and followers, roles and duties are assigned. Formal games fall into Cooperative Play.

Organizing Data

Time Samplings take some thought and require advanced preparation. It does not need to be complicated, but there is a process to follow. As you review the Time Sampling, ask yourself what you can interpret by collecting this data. Does the frequency of this behavior affect the child's ability to learn in other ways? What changes can be made to the classroom to lessen the undesired behavior? As you consider those questions, reflect on a plan of action that you might use to support that child's development further. How can you provide opportunities for the child to gain other skills? Using a Time Sampling is not a one-and-done type of method. Repeated use of the same Time Sampling over multiple days will establish the representation needed to interpret and evaluate the child's behavior.

Time Sampling Example

Name:			Teacher:			Date:	
Age:			Domain of Dev:			Time:	
Setting:							
Situation:							
Time	Unocc.	Onlook	Solitary	Parallel	Assoc.	Coop.	Comments

For original work, please see page 44.

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5.9.5: Anecdotal Records

Learning Objectives

1. Define anecdotal record.
2. Explain how anecdotal records are used to document specific child behaviors and developmental progress.
3. Identify the components of a high-quality anecdotal record.

What is an Anecdotal Record?

An Anecdotal Record is “an informal observation method often used by teachers to understand the child’s personality or behavior. It provides a running account of behavior that is either typical or unusual for the child” (Bentzen, 2009, p. 178). Anecdotal Records, also called "anecdotal notes," are direct observations of a child that offer a window of opportunity to see a child's actions, interactions, and reactions to people and events.

When to Use an Anecdotal Record

An Anecdotal Record is an excellent tool that provides teachers with a collection of narratives that can be used to showcase a child's progress over time. Compared to a running record, anecdotal records provide brief notes focused on a specific event or activity. Anecdotal Records are the most practical and useful of all of the observation methods for classroom teachers. These records focus on typical and atypical child behaviors.

Advantages and Disadvantages

Table 5.9.5.1. Advantages and Disadvantages of Anecdotal Records

Advantages	Disadvantages
Provides vivid details about the who, what, when, where, and how	Data can be tainted if it is not written in the moment
Takes less time to write up an observation as compared to using Running Records	Focuses on one event, situation, or behavior at a time and can miss or overlook important information
Evidence is documented as it occurs, in a sequence	Does not provide quantitative data results
Provides objective and descriptive evidence	May not always report a child’s typical pattern of development or behavior
Interpretation notes can be added afterwards	Bias can affect the selection of events to record
Evidence can be gathered formally (planned) or informally (spontaneously)	Improper wording can lead to misinterpretations
No special training is required	
Provides qualitative data over time and helps track changes in a child’s development over time	

Collecting Your Data

To gather useful observation evidence, you need to include the following components:

1. Accurate and specific details of the event (vivid descriptions precisely as you see and hear them happening - do not summarize, assume, or make judgments)
2. The context, setting, and situation that surrounds the event (the where, when, who, what, and how)
3. Objective facts about the child’s behavior and interactions (report actions and conversations)
4. Write records in the past tense

Here are some examples of observation evidence you might want to gather:

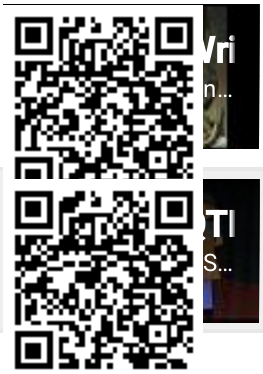
- Social interactions with peers
- Every day routines, like mealtime and transition times
- How they utilize materials at the various centers (block, math, science, art, music)
- How they engage in teacher-directed activities (structured learning opportunities)
- How they engage in child-directed activities (open exploration opportunities)
- How they are inside and how they are outside

Anecdotal Records are considered an informal method of observation. Since you are observing only a particular event or behavior, Anecdotal Records are selective. If you observe typical and/or atypical behaviors, you are also being selective in your recording. The amount of inference is made when you are observing atypical behaviors. You need to infer if the behavior is typical or atypical for a child at that age.

Organizing Your Data

Once you have completed the Anecdotal Record, you will take a moment to interpret the data. You will look for patterns and note whether the data reflects typical or unusual behavior for the child. To measure a child's developmental progress, you will look for their strengths (skills and milestones that have been mastered) and their needs (skills and milestones that the child needs further support with). The summary notes help you clarify instructional recommendations (adjustments that you will make to the environment to accommodate the child's learning style). The records you take can help you generate developmentally appropriate lesson plan activities and interactions. All Anecdotal Records must be dated and stored safely in the child's portfolio or file folder.

Put It Into Practice

Putting it Into Practice	Video	Video Description and Text Link
. Writing Anecdotal Records		*4C Writing Observation: Documentating a Child's Development Through Observations* by Independence Television Text link: https://www.youtube.com/watch?v=GsXvbflrLu4&t=92s
. Using Anecdotal Records		*NCQTL- Anecdotal Records* by Casey Swain Text link: https://www.youtube.com/watch?v=KAczTiO1rUg&t=3s

Examples

Without Interpretation/Evaluation

Date/Time	Sept 9, 4:15 p.m.-
Setting/Situation	Room 4 Outdoor; Complies with a request
Teacher	Carol
Child's Name and Age	Rocky, 3
Domain	Social relationships

Observation: Rocky is playing in the sandbox with his two other friends. A teacher calls him three times. He looks up and then goes back to play. The fourth time, he asks, "Why?" He starts walking up to the steps with his arms crossed over his chest, his eyes frowned, and his lips protruded.

With Interpretation/Evaluation

Date/Time	February 2, 8:39 a.m.
Setting/Situation	Room 2 Indoor; Still breakfast time
Teacher	Sari
Child's Name and Age	Willow, 2
Domain	Developing self-help skills

Observation: Only three girls are eating at the table. Willow is holding a slice of toasted bread in her left hand. Then, she lifts her right hand and picks up a small spoon containing some peanut butter. She places the spoon over the bread and attempts to spread the peanut butter on it from right to left.

Interpretation/Evaluation: Willow seems to like to try things out by herself. I guess she observed or remembered someone spreading the peanut butter on the bread and wanted to do it as well. I believe this relates to Vygotsky's theory, in which there is an impact on the children's social interactions and cultural influences as well. It seems obvious that she knows that the peanut butter could be spread out on the bread, which could result from a cultural practice that she has noticed in the people around her.

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5.9.6: Running Records

Learning Objectives

1. Define a running record.
2. Explain how running records differ from other observation methods in terms of purpose, structure, and data collection.
3. Identify the essential components of a running record.

What is a Running Record?

The Running Record is one of the oldest observation methods used in early childhood education. **Running Records** are considered by some as an "informal method" of observation compared to Narrative Descriptions or Specimen Records, which are considered more "formal methods" of collecting data. The primary difference between the two methods is that with a Running Record, evidence is gathered more spontaneously (informal) as it occurs. In contrast, with a Narrative Description, a (formal) plan would be arranged in advance, prior to the observation. More specifically, you would schedule a day, time, and setting, select a specific child or group of children, and decide on the purpose, reason, or focus of your observation (e.g., cognitive skills, social interactions, play patterns). Both methods provide rich, detailed evidence and written accounts of everything you see and hear a child doing during a specific timeframe (Bentzen, 2009).

When to Use a Running Record

For the purpose of this text, we will use the term **Running Record** and recommend that you, as an intentional professional, conduct Running Records (whether spontaneous or planned, informal or formal) as part of your regular or routine observations. The primary goal for using a Running Record is to "obtain a detailed, objective account of behavior without inference, interpretations, or evaluations" (Bentzen, 2009, p.112). You will know you have gathered good evidence when you can close your eyes and "see" the images in your mind as described in your Running Record (Bentzen, 2009).

Advantages and Disadvantages

Table **5.9.6.1**. Advantages and Disadvantages of Running Records

Advantages	Disadvantages
Provides detailed data about the who, what, where, and when.	Time-consuming and staff energy.
Evidence is documented as it occurs, in a sequence.	The expense may be prohibitive if professional needs additional support staff to remain in ratio while they observe the child for an extended time.
Provides objective and descriptive evidence.	It may be difficult to keep up and follow as children move quickly from one activity to another.
Appropriate for gathering baseline information about the child's interests, abilities, and skill level.	Not a practical technique for professionals who are in ratio.
Ideal for tracking a child's development over time.	Behaviors may not be typical for that observation day as compared to other days.
Raw data becomes more valuable when past running records are compared to current observations.	
Less structured, more free-flowing.	
Evidence can be gathered formally or informally.	
Interpretations and reflections can be added later.	

Collecting Data

You only need time, paper, and a pen to gather your observation evidence. The goal with a running record is to write down continuously (everything) you see and hear - exactly as it occurs, without adding any comments or attaching any opinions. As the saying goes, “just the facts, ma’am!” With the Running Record format, you will highlight children’s behaviors and record the “setting, situation, and sequence” in which the behavior occurred.

Be as descriptive as possible and yet be as concise as possible. Children move quickly, so you must write quickly. When conducting a Running Record, you need to be out of ratio. You are to step back and observe from a distance. Do not interfere with the child’s natural play, do not ask questions, or run after them. Be as invisible as possible.
As you record your Running Record observations, think about how you can convey exactly what you are seeing and hearing the child do and say to your reader. The chief goal for a Running Record is DETAIL. Your reader should have a mental picture of the scene you are describing. This can be difficult, but your running record skills will improve with practice.

Running records have no limits, but it is important to remember practical considerations. For instance, a teacher continuously recording what the child does and says for more than an hour straight is not practical. Most Running Records should be up to 20 minutes in length. Anything past 20 minutes is difficult for one observer to record physically (hand begins to hurt) and mentally (you start to lose focus). This is when you can make errors of omission, transmission, and commission.

Running Records are considered an informal method of observation. Running Records are unselective since you observe and record everything the child does and says. The amount of inference is minimal. Since you observe everything during the 20-minute period, you do not need to infer whether a behavior is something to record. Everything is being recorded.

Organizing Data

As you collect rich, detailed data throughout the school year, you will begin to recognize development patterns and see each child’s unique attributes, personalities, and abilities as they emerge. Be sure to date all your running records; having 12-24 children in your classroom can add up to many running records. You must store your Running Records safely in a portfolio or file folder. When it comes time to assess a child’s development, you will be able to look back and review all the evidence you have collected and monitor the child’s progress over time. If your program uses the DRDP, you can incorporate the observations from the Running Records into one or more of the eight domains.

Note: A Running Record is an ideal observation method for “students”. Classroom teachers may not always have the time or staff coverage to conduct a Running Record. Running Records should be used when you have a child with puzzling behavior. By recording for an extended period of time, you will get a better idea of their overall development.

Example Running Record

Name and Age	Amelia, 4
Teacher	Sylvie
Date/Time	August 30; 2:35 P.M. - 2:55 P.M.
Setting	San Marcos ECELS Inside classroom- Puzzle area
Situation	Children are given 30 minutes of free playtime after naptime

2:35 PM-

Amelia is prominently sliding a puzzle off the puzzle shelf with her right hand while supporting it with her left. She successfully slides the puzzle from the horizontal shelf without dropping any puzzle pieces. The puzzle is a 6'x 6' blue butterfly-shaped puzzle with approximately twenty pieces. She holds the puzzle piece with both hands and takes three steps from the shelf. She bends her upper body while extending both hands away from her torso and pushes the puzzle towards the floor. After Amelia places the puzzle on the floor, she rises back and sits crisscross applesauce in front of the puzzle. She flips the puzzle upside down, so all the puzzle pieces are still formed like a butterfly on the floor. She flips the board right side up and places it to the right of the puzzle

pieces. She uses her right hand to pick up the first puzzle piece that belongs to the butterfly's wing. She starts from the bottom of both wings using her right hand throughout the entire process, and sixty seconds later, she has completed the puzzle.

2:37 PM-

After completing the butterfly puzzle, Amelia picks it up with both hands and places it on the horizontal shelf from where it was initially. She looks for another puzzle, extends her right arm, and slides it out. She takes three more steps and sits 6' to a boy's right. While holding the puzzle, she sits crisscross applesauce on the floor. She places the puzzle on the ground in front of her. She stares at a puzzle piece that does not belong to her puzzle, picks it up with her right hand, and throws it forward. The puzzle piece lands approximately two feet in front of her. After throwing the puzzle piece, she picks up the puzzle with both hands. This time, she flips it upside down diagonally to her left. She flips the puzzle board right side up and places it in front of her. She grabs a puzzle piece with her right hand and puts it in the correct spot. She looks at the boy and says, "I'm doing the police one. Finish yours." While the boy is trying to complete his puzzle, Amelia finishes her puzzle in a minute.

2:40 PM-

Once Amelia finishes the "police puzzle" she stands up. She picks up the puzzle with both hands, walks to the shelf, and slides the puzzle back into the horizontal shelf. She looks at another puzzle that is on top of the shelf. After staring at it for six seconds, she lifts her hands and lifts it off the shelf. She turns around and takes three steps. Amelia places the puzzle on the floor first, then sits behind it. She lifts the puzzle from the ground and flips it upside down, so the puzzle pieces are lying on the floor. She picks up a puzzle piece and places it in the correct spot. Within a minute, she completes the puzzle with no distractions. She walks back to the shelf and places the puzzle back on the shelf with both hands…. The observation continues for a 20-minute block.

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5.9.7: Work Sample

Learning Objectives

1. Define what a work sample is.
2. Explain how a work sample provides authentic evidence of a child's learning and development.
3. Identify appropriate types of work samples that represent growth across all developmental domains.

What is a Work Sample?

Professionals and parents have been collecting and posting children's artwork on the walls forever. Not only do the children enjoy seeing their work of art on display, but parents appreciate seeing their child's work as well! To create an official work sample, however, takes more effort than hanging a picture on the wall. What exactly is a work sample? A **work sample** is tangible evidence showcasing a child's effort, progress, and achievement. More specifically, not only does a work sample highlight the final product, it can also highlight the process by emphasizing the child's problem-solving efforts, experimentation methods, or collaboration skills. Work samples are authentic artifacts that provide information about the child's learning experience.



Figure **5.9.7.1**. A Child's Masterpiece. Image by Dragos Gontariu on Unsplash.

Advantages and Disadvantages

Table **5.9.7.1**. Advantages and Disadvantages of Work Samples

Advantages	Disadvantages
Provides tangible/ visible evidence that teachers can use to track a child's learning, growth, and development over time	Can be time-consuming, adding anecdotal documentation and creating documentation boards
Parents and children both enjoy seeing the work on display	Requires ample storage space
Provides authentic documentation, which is ideal for assessment	Requires a financial investment in technology (camera, video, or audio recorder)
Professionals can use information to plan and adjust the curriculum to help children achieve their learning goals	Concerns over confidentiality and privacy when using photos, audio,o or videos
Families can see how children learn through play	Intentionally left blank.
Children can share their insights as to how they created the work sample and offer their perspectives as to what they were thinking (authentic evidence)	Intentionally left blank.

Collecting Data

Work samples can be gathered throughout the school year. Typically, you would collect various samples that highlight the child's overall development in each developmental area: Physical, Cognitive, Language, and Social-Emotional. More specifically, you

might include a child's drawing or painting, a writing sample from their journal, a cutting sample, or photographs of the child engaged in activities such as building a block tower, sandcastle, or riding a bike.

Organizing Data

Whether you post a work sample for viewing (using a documentation board) or collect a sample for a child's portfolio, you must add documentation. Not only will documentation help families recognize the value of play, it reinforces the concept that every activity is an opportunity to learn. For accuracy, be sure to include the following information:

- Child's Name;
- Date; Setting; and
- An Anecdotal Note with a description about how and why the sample was collected.

Work samples should be organized chronologically to showcase progress over time. Be sure to store them in a safe place, such as a file folder or portfolio, or electronically in a computer file.

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CHAPTER OVERVIEW

6: Assessment

6.1: Assessing Children's Development
6.2: Monitoring
6.3: Screening
6.4: Evaluations
6.5: The Referral Process
6.6: Public Policies on Inclusion
6.7: Communicating with Families

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6.1: Assessing Children's Development

Learning Objectives

1. Define assessment.
2. Explain the importance of early identification and intervention for developmental delays and disabilities.
3. Describe the early childhood professional's role in supporting families through developmental monitoring, referrals, and access to services.

In early childhood, **assessment** is the on-going process of observing, documenting and analyzing children's growth and development to inform practices that support each child's progress. The term "on-going" in early childhood means, the process should be embedded into daily routines, allowing caregivers and professionals to gather authentic information about children as they engage in familiar activities. Assessment should be developmentally appropriate, using methods that match the child's age, interests, and abilities, such as play-based observation, work samples, or checklists. Assessment practices must also be culturally and linguistically responsive, recognizing and respecting each child's background and home language. Rather than being used to label or sort children, assessment should serve to guide curriculum planning, monitor development, and ensure that all children receive the support they need. It also plays an important role in evaluating program effectiveness and holding professionals accountable for the quality of care and education provided. Engaging families in the assessment process is essential, as their input and observations offer valuable insight into the child's learning across contexts.

However, because many parents are not familiar with developmental milestones, they might not recognize that their child has a developmental delay or disability. According to the Centers for Disease Control and Prevention,

> *"In the United States, about 1 in 6 children aged 3 to 17 years have one or more developmental or behavioral disabilities, such as autism, a learning disorder, or attention deficit / hyperactivity disorder (ADHD)."*

What's more concerning is that many children are not being identified as having a delay or disability until they are in elementary school. Subsequently, they will not receive the appropriate support and services they need early on to be successful at school. In both educational and medical professional literature, it has been well-documented that developmental outcomes for young children with delays and disabilities can be greatly improved with early identification and intervention (Squires, Nickel, & Eisert, 1996; Shonkoff & Meisels, 2000). While some parents might be in denial and struggling with the uncertainty of having a child with special needs, some parents might not be aware that there are support services available for young children, and they may not know how to advocate for their child. Thus, as early child educators, we have an obligation to help families navigate through the process of monitoring, as well as provide information and resources if a screening or evaluation is necessary.

References, Contributors and Attributions

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6.2: Monitoring

Learning Objectives

1. Describe the purpose and process of developmental monitoring in early childhood settings.
2. Explain how observation and documentation help identify young children's behavioral patterns, strengths, and developmental concerns.
3. Outline appropriate steps to take when a developmental concern arises, including communication with families and collaboration with specialists for further screening or evaluation.

The Process of Monitoring

Who can monitor a child's development? Parents, grandparents, early caregivers, providers, and teachers can monitor the children in their care. One of the tasks of an intentional early childhood professional is to gather baseline data within the first 60 days of a child starting their program. With each observation, professionals listen to how a child speaks and if they can communicate effectively; they watch to see how the child plays and interacts with their peers; and they record how the child processes information and solves problems. By monitoring a child closely, not only can we observe how a child grows and develops, but we can also track changes over time. More importantly, we can identify children who fall outside the parameters of what is considered normal or "typical" development.



Figure 6.2.1. Children sitting at the table with their teacher as she observations their creative process. Image by Yan Krukau is licensed by Pexels.

When early childhood professionals monitor children, they are observing and documenting whether children are mastering "typical" developmental milestones in the physical, cognitive, language, emotional, and social domains of development. In particular, professionals are tracking a child's speech and language development, problem-solving skills, fine and gross motor skills, social skills, and behaviors, so that they can be more responsive to each child's individual needs. Even more so, teachers are trying to figure out what a child can do and if any "red flags" or developmental areas need further support. As early caregivers and professionals, we are not qualified to formally screen and evaluate children. We can, however, monitor children's actions, ask questions that can guide our observations, track developmental milestones, and record our observations. With this vital information, we can make more informed decisions on what is in the child's best interest.

What is the Child Trying to Tell Me?

With 12-24 busy children in a classroom, there are bound to be occasional outbursts and challenging behaviors to contend with. In fact, a portion of a teacher's day is typically spent guiding challenging behaviors. With all the numerous duties and responsibilities that a teacher performs daily, dealing with challenging behaviors can be taxing. When a child repeats a challenging behavior, we might be bothered, frustrated, or even confused by their actions. We might find ourselves asking questions like:

- "Why does she keep pinching her classmate?"
- "Why does he put his snack in his hair?"

- “Why does he cry when it’s clean-up time or when he has to put his shoes on?”
- “Why does she fidget so much during group time?”

Without taking the time to observe the potential causes and outcomes associated with the challenging behavior, we may only be putting on band-aids to fix a problem, rather than trying to solve the problem. Without understanding the why, we cannot properly guide the child or support the whole child’s development. As intentional teachers, we are taught to observe, document, and analyze a child’s actions so we can better understand what the child is trying to “tell” us through their behavior. Behavior is a form of communication. Any challenging behavior that occurs over and over is happening for a reason. If you can find the “pattern” in the behavior, you can figure out how to redirect or even stop the challenging behavior.

How Do I Find the Patterns?

To be most effective, it is vital that we record what we see and hear as accurately and objectively as possible. No matter which observation method, tool, or technique is used (e.g., Event Sampling, Frequency Counts, Checklists, or Technology), once we have gathered a considerable amount of data, we will need to interpret and reflect on the observation evidence so that we can plan for the next step. Finding the patterns can be instrumental in planning curriculum, setting up the environment with appropriate materials, and creating social situations that are suitable for the child’s temperament.



Think About It...Patterns

What does this tell you if Wyatt is consistently observed going to the sandbox to play with dinosaurs during outside play? What is the pattern? Is Wyatt interacting with other children? How is Wyatt using the dinosaurs? How can you use this information to support Wyatt during inside play?

Here are a few ideas:

To create a curriculum: Knowing that the child likes dinosaurs, I might lay down some butcher paper on a table, put a variety of dinosaurs out on the table, and add some trays with various paint colors to encourage the child to go into the art center.

To arrange the environment: Looking at my centers, I might add books and pictures about dinosaurs and materials that could be used in conjunction with them.

To support social development: I noticed Wyatt playing alone on several observations. I may need to do some follow-up observations to see if Wyatt is initiating conversations, taking turns, joining in play with others, or playing alone.

As you can see, these are just a few suggestions. What ideas did you come up with? As we monitor children in our class, we are gathering information so that we can create a space where each child’s individual personality, learning strengths, needs, and interests are all taken into account. Whether the child has a disability, delay, or impairment, or is developing at a typical pace, finding their unique pattern will help us provide suitable accommodations.



Figure 6.2.2. Young boy is jumping and splashing in a puddle. Sometimes, early childhood professionals need to adjust the environment, time, or activity by which the observation is taking place in order to get a well-rounded picture of what is happening developmentally. Image by Luna Lovegood is licensed by Pexels.

What is a Red Flag?

If a “red flag” is identified while monitoring a child's development, it is the professional’s responsibility to inform the family, in a timely manner, about their child’s developmental progress. First, the professional and family would arrange a meeting to discuss what has been observed and documented. The teacher and family would share their perspectives about the child’s behavior, practices, mannerisms, routines, and skill sets at the meeting. There would be time to ask questions and clarify concerns, and a plan of action would be developed. It is likely that various adjustments to the environment would be suggested to meet the individual child’s needs, and ideas on how to tailor social interactions with peers would be discussed. With a plan in place, the teacher would continue to monitor the child. If, after a few weeks, there is no significant change or improvement, the teacher may then recommend that the child be formally screened and evaluated by a professional (e.g., a pediatrician, behavioral psychologist, or speech pathologist).

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6.3: Screening

Learning Objectives

1. Explain the purpose and benefits of developmental screenings in early childhood.
2. Differentiate between developmental delays and developmental disabilities.
3. Identify common developmental screening tools used in early childhood programs and describe when and how they are typically administered.

Developmental screenings are cost-effective and can be used to assess a large number of children in a relatively short period of time. There are screenings to assess a child's hearing and vision, and to detect notable developmental delays. Screenings can also address some common questions and concerns that early childhood professionals and parents alike may have regarding a child's academic progress.

For example, when an early childhood professional wonders why a child behaves in such a way, they will want to observe their social interactions and document how often certain behaviors occur, similarly, when a parent voices a concern that their child is not talking in complete sentences the way their older child did at that same age. The professional will want to listen and record the child's conversations and track their language development to determine if further screening is warranted. Then, those observations can help inform what screening tool should be selected and used.

Who Can Screen Children?

While screening tools are designed to be user-friendly and straightforward, there are important considerations and guidelines regarding who can appropriately conduct screenings for children. Screening is typically conducted by individuals trained in the use of specific screening tools, such as early childhood educators, professionals, nurses, pediatricians, development specialists, etc. Training ensures that the screener understands the tool, knows how to administer it properly, and can interpret the results correctly.



Figure 6.3.1. Screenings can be done for a variety of reasons include vision impairments and hearing loss- as both of these disabilities would impact the child's educational process. Image by Pavel Danilyuk is licensed by Pexels.

However, some tools are designed to involve parents or caregivers, such as the Ages and Stages Questionnaires (ASQ) or the Vineland Adaptive Behavior Scales. Professionals often guide the process, helping parents and caregivers understand the questions and contextualize the responses. Therefore, it comes down to the tool being used and the purpose it is being used for, whether there is a suspected developmental delay and/or developmental disability.

Developmental Delays vs. Disabilities

Developmental delays refer to a child being less developed mentally or physically than is normal for their age. Whereas a developmental disability, according to the Centers for Disease Control (2024), is a group of conditions due to an impairment in physical, learning, language, or behavior areas. These conditions begin during the developmental period, may impact day-to-day functioning, and usually last throughout a person's lifetime. Some noted disabilities include:

- ADHD
- Autism Spectrum Disorders
- Cerebral Palsy

- Hearing Loss
- Vision Impairment
- Learning Disability
- Intellectual Disability.

When there is a suspected developmental delay and/or disability, the first step is always to complete a screening. Sometimes, these screenings may be conducted in an early learning program to support making a referral to the appropriate agency. Sometimes the screenings (and evaluations) will occur as part of the referral process to determine if the child is eligible for services.

Common Screening Instruments

Screenings are designed to be brief (30 minutes or less) and are intended to determine whether further evaluation is recommended, inform program practices, and/or aid in the monitoring process.

- Ages and Stages Questionnaires (ASQ) and Ages and Stages Questionnaires- Social and Emotional (ASQ-SE), Brookes Publishing Company (available in Spanish, French, and Korean)
- Communication and Symbolic Behavior Scales Developmental Profile (CSBS-DP), Brookes Publishing Company
- Battelle Developmental Inventory Screening Test, Riverside Publishing
- Developmental Indicators for Assessment of Learning (DIAL) III, Pearson Assessments (includes Spanish materials)
- Dynamic Indicators of Basic Early Literacy Skills (DIBELS), University of Oregon Center on Teaching and Learning
- Early Screening Inventory-Revised (ESI-R), Pearson Early Learning (includes separate scoring for preschool and kindergarten
- Vineland Adaptive Behavior Scales, Pearson Assessments

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6.4: Evaluations

Learning Objectives

1. Describe the purpose and process of formal developmental evaluations and how they differ from monitoring and screening.

Evaluations are conducted by professionals in the field(s) where the developmental delay(s) and/or disability(ies) is/are suspected. This could include doctors, pediatricians, speech pathologists, occupational therapists, behavior analysts, and more. Evaluations are more formal than monitoring and routine screenings. Developmental evaluations, which can include the use of screening tools by professionals, take a closer look at how a child is developing. Often, professionals will use multiple tools as part of the evaluation process to provide a well-rounded picture of the child's current capabilities and validate scores across multiple sources.

Depending upon the nature of the red flag, a battery of tools can be used to evaluate a child's development. Here are some guidelines:

- A more comprehensive assessment and formal evaluation must be conducted by a professional in order to confirm or disconfirm any red flags that were raised during the initial monitoring or screening process
- Families must be treated with dignity, sensitivity, and compassion while their child is going through the screening process
- Use a screening tool from a reputable publishing company

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6.5: The Referral Process

Learning Objectives

1. Differentiate between the referral, evaluation, and service planning processes for children under age 3 (IFSP) and those age 3 and older (IEP).
2. Explain the structure and purpose of an IFSP and an IEP, including how goals are set, services are delivered, and transitions are planned to meet children's developmental and educational needs.

What is a Referral?

A **referral** is the formal process of requesting a developmental evaluation or specialized assessment when there are concerns about a child's growth, learning, or behavior. The goal of the referral process is to ensure that children with potential developmental delays or disabilities are identified early and connected to appropriate services. Early identification and intervention can significantly improve developmental outcomes, especially when support is provided during critical periods of growth.

Referrals may be prompted by observations from parents, teachers, childcare providers, or healthcare professionals who notice that a child is not meeting developmental milestones or is struggling in ways that differ from same-age peers. The referral process acts as a gateway to further evaluation and, when needed, access to services such as speech therapy, physical therapy, or special education support.

Because developmental concerns can arise at any age, referral processes are designed differently for infants and toddlers (birth to age 3) and for preschool- and school-aged children (age 3 and older). The following sections describe how referrals are made and managed in each age group.

Referral Process for Children Under Age 3

The referral process begins with identifying developmental concerns arising from various sources. Parents may notice delays in their child's milestones, pediatricians may identify potential developmental issues during routine checkups, or childcare professionals may observe atypical behaviors or skills. Practitioners often use standardized developmental screening tools, such as the Ages and Stages Questionnaire (ASQ), to determine if further evaluation is needed (Centers for Disease Control and Prevention [CDC], n.d.). Once concerns are identified, the child is referred to the state's early intervention system. Referrals can be made by anyone familiar with the child's development, including parents, healthcare providers, or teachers/caregivers, and parents can also contact their state's early intervention office directly. By law, referrals must be addressed promptly, with contact initiated within seven calendar days (Shonkoff & Meisels, 2000).

Following the referral, the child undergoes a comprehensive, multidisciplinary evaluation to determine eligibility for services. This evaluation assesses areas such as communication, motor, cognitive, social-emotional, and adaptive skills. Eligibility criteria vary by state but typically include children with significant developmental delays or a diagnosed condition that increases the risk of delays (Quire et al., 1996). If the child is deemed eligible, an IFSP is developed within 45 days of the referral. An **Individualized Family Service Plan (IFSP)** is a family-centered plan designed to support children under the age of three who have developmental delays or disabilities. This plan outlines specific goals for the child's development, the services required (e.g., physical or speech therapy), and how and where these services will be provided. The IFSP is reviewed every six months and updated annually to ensure it continues to meet the child's and family's needs.

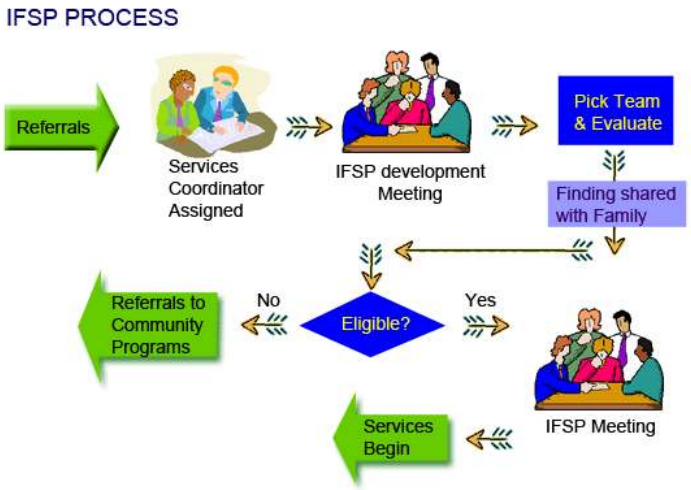


Figure **6.5.1**. IFSP Process. from Genevieve Howard.

The IFSP process focuses on delivering early intervention services in natural environments, such as the home or childcare setting. It is governed by Part C of the Individuals with Disabilities Education Act (IDEA). As the child approaches their third birthday, the IFSP team collaborates to develop a transition plan. This plan ensures a seamless shift to preschool services, which may involve an evaluation for eligibility under an Individualized Education Program (IEP) governed by Part B of IDEA.

Referral Process for Children Over Age 3

For children aged three and older, the referral process transitions to the school district and focuses on developing an **Individualized Education Program (IEP)**. This process ensures that children continue to receive support for developmental or educational challenges within the school-based setting.

Concerns about a child's development or learning may arise from various sources, including parents, preschool teachers, or healthcare providers. Parents or caregivers can initiate a referral by contacting their local school district's special education department or the Child Find program, a federally mandated initiative that helps identify children with disabilities. Upon receiving a referral, the school district must respond within a specific timeframe, which typically ranges from 10 to 15 days, depending on state regulations. Parental consent is required to proceed with the evaluation.

The evaluation process involves a multidisciplinary team conducting assessments in all areas of suspected need, such as communication, motor, cognitive, or social-emotional skills. The evaluation must be completed within 60 days of receiving parental consent. Eligibility for an IEP is determined based on whether the child meets criteria under one of IDEA's recognized disability categories, such as developmental delay or speech/language impairment (Marston, 2018).

If eligible, an IEP team—including parents, teachers, and specialists—collaborates to develop the plan. The IEP outlines measurable goals, necessary accommodations, and the services the child will receive, such as speech therapy or occupational therapy. Services are typically provided in the least restrictive environment (LRE), such as an inclusive preschool classroom. The IEP is reviewed annually to monitor progress, and reevaluations occur at least every three years to ensure the plan remains appropriate.

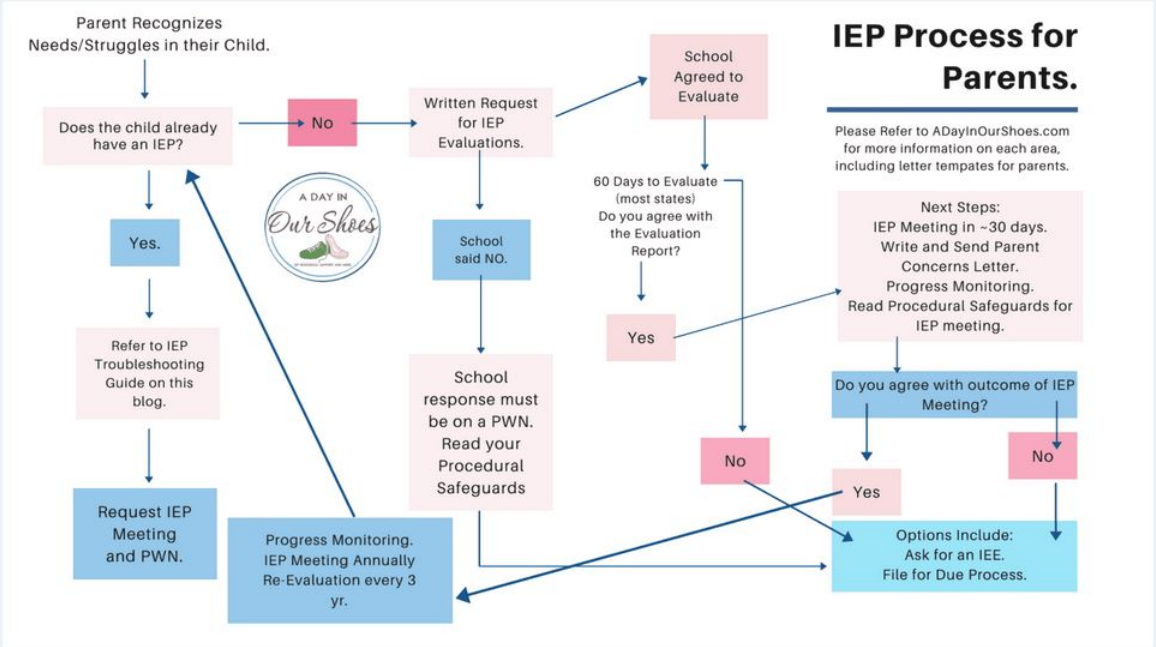


Figure 6.5.1. IEP Process for Parents. from A Day in Our Shoes with Lisa Lightner.

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6.6: Public Policies on Inclusion

Learning Objectives

1. Identify key federal laws that support the inclusion and educational rights of children with disabilities.
2. Explain the role of professional organizations such as DEC and NAEYC in advocating for inclusive early childhood practices.
3. Describe how early childhood professionals can create inclusive, developmentally appropriate environments that promote access, participation, and support for all learners.

Public Policies on Including Children With Special Needs

Throughout the past 40 years, there have been some significant changes in both state and federal laws, as well as in public policy and social attitudes towards integrating children with special needs and learning disabilities into typical classroom settings. Stigmas from the past have dissipated, and more inclusive practices are in place. Several federal laws serve to protect children with special needs, including:

1. **Individuals with Disabilities Education Act (IDEA)**: This act ensures free, appropriate public education (FAPE) for children with disabilities and provides early intervention, special education, and related services.
2. **Section 504 of the Rehabilitation Act (1973)**: Prohibits discrimination based on disability in federally funded programs and provides accommodations to ensure equal access to education.
3. **Americans with Disabilities Act (ADA)**: This act extends anti-discrimination protections to all public and private spaces, including schools, ensuring equal opportunities for children with disabilities.
4. **Every Student Succeeds Act (ESSA)**: This act includes provisions to improve educational outcomes for students with disabilities, emphasizing accountability and inclusive practices.
5. **Family Educational Rights and Privacy Act (FERPA)**: Protects the privacy of student education records, including those of children with disabilities.

In addition to these federal laws, national associations such as the Division for Early Childhood (DEC) and the National Association for the Education of Young Children (NAEYC) rally to protect the rights of children with disabilities or other special needs. As stated in their joint position on inclusion, the DEC and NAEYC believe:

> *Early childhood inclusion embodies the values, policies, and practices that support the right of every infant and young child and his or her family, regardless of ability, to participate in a broad range of activities and contexts as full members of families, communities, and society. The desired results of inclusive experiences for children with and without disabilities and their families include a sense of belonging and membership, positive social relationships and friendships, and development and learning to reach their full potential. The defining features of inclusion that can be used to identify high quality early childhood programs and services are access, participation, and supports. (p. 141; DEC and NAEYC 2009, 1)*

When early childhood professionals and preschool teachers practice monitoring as part of their regular routines, they demonstrate accountability and responsive caregiving. Nearly 65% of children are identified as having a special need, disability, delay, or impairment, and will require some special services or intervention. As early educators, our role is twofold:

1. Provide an environment where children feel safe, secure, and cared for; and,
2. Help children develop coping skills to decrease stress and promote learning and development.

Creating Inclusive Learning Environments



Figure 6.6.1. Playing Together. Image by Antoni Shkraba is licensed CC0.

To ensure that all children feel safe, secure, and nurtured, teachers and early childhood professionals must strive to create a climate of cooperation, mutual respect, and tolerance. To support healthy development, teachers and professionals must offer multiple opportunities for children to absorb learning experiences and process information at their own pace. While one child may be comfortable with simple verbal instructions to complete a particular task, another child may benefit from a more direct approach, such as watching another child or adult complete the requested task first. Those who are devoted to observing their children are motivated to provide experiences that children will enjoy and be challenged by. The classroom is not a stagnant environment - it is ever-changing. In order to maintain a high-quality classroom setting, it is essential to utilize your daily observations of children and the environment to monitor the experiences and interactions to ensure there is a good fit (Morin, 2020).

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6.7: Communicating with Families

Learning Objectives

1. Describe the purpose and importance of family conferences in early childhood education and how they foster collaboration between educators and families.
2. Identify effective communication strategies and cultural considerations that promote trust, understanding, and respectful dialogue during family conferences.

Family Conferences

Once assessments have been completed, it is time to meet with a child's family. The purpose of the conference is to share information about the child and to build a vital partnership with the child's family. Some parents may not understand the connection between play and learning. Sharing information about play-based curriculum and how it supports development can allow parents to better understand your goals for learning and how the classroom functions. By including parents in discussions about curriculum and assessments, we can encourage the development of support areas outside of the classroom.

For example, suppose the individualized curriculum supports color recognition. In that case, we suggest that families continue to support this skill by identifying produce colors at the grocery store and/or pointing to certain colors in their favorite books.

Tips for Success

In a blog by Concordia University, Portland (2018), some key tips are suggested to ensure a successful and engaging family conference occurs:



Figure 6.7.1: Parent Teacher Conference. Image by Innovation School is licensed CC BY-NC 2.0.

1. **Offer a flexible conference schedule.** Some parents have more than one child at different schools, some families may have limited transportation options, and some parents may work multiple jobs, which can limit their time and availability. In these cases, teachers and other early childhood professionals may need to be flexible to accommodate special circumstances. If technology is available, meetings can be offered via Skype, Zoom, Google Meet, or FaceTime as an option for parents who cannot attend in person.
2. **Prepare, prepare, prepare.** Each child's portfolios and assessments must be updated and organized regularly.
3. **Arrange for a translator if needed, and find a way to connect.** Parents who don't speak English require a translator. If programs cannot arrange for a translator, family members may need to sit in on the conference, such as an older sibling, aunt, or even neighbor. — ideally not a student.
   When there is a language barrier, early childhood professionals should try to find a respectful way to communicate and connect with families. Even though families cannot speak the same language fluently, they deserve your professional approach. Try learning a few phrases in their native language to show you're trying to connect; even "Hello," "How are you?" and "Thank you" can go a long way.
4. **Be aware of your body language and how you verbally communicate.** The learning environment and your body language and how you talk with families speak volumes. Check out your body language.
   - Are your arms typically crossed?
   - Do you smile or glare?
   - How is your tone when you speak?
   - Are you calm and reassuring, or sounding like a robot?

- Do you pause and allow parents to ask questions, or are you hurried and rushing through information?
- Are you aware of and considerate of cultural backgrounds and family practices? For example, did you know that eye contact and handshaking may not be common practices in some families?



Figure 6.7.2: Carol Mahn (right), a first grade teacher at Hanscom Primary School, meets Melissa Weyand and her son Maximas, during a "Meet and Greet". Image is in the public domain.

5. **Sit side-by-side.** Since early childhood professionals, educators, and parents are on the same team, sitting next to parents rather than across from them behind a desk is advised. By arranging the furniture in a friendly and non-threatening way, professionals may express their desire to build a partnership with each parent, which can diffuse unnecessary tension on both sides.
6. **Share real stories and student work.** Even the best early childhood professionals can't remember all of the details they need to share with every parent. A portfolio with anecdotal notes and work samples provides parents with real insight into what's happening in their child's academic day.
7. **Include the positive and focus on what the child can do.** Each student has positive traits and potential. Share at least one shining trait with parents at the beginning and another at the end of the conference. That trait could be an academic or character trait, such as helpfulness, persistence, or hard work. One can follow the "sandwich method" or the "glows and grows" method, where you share a child's positive achievements or traits that make them glow and provide two or more areas in which they can grow. Always end on a high note with another glowing detail or anecdote.
8. **Create clear goals.** Every student, even the gifted ones, can improve in some way. Write specific goals for each student. Along with those goals, create an action plan with steps for improvement and a timeline. Your plan of action should include activities that will be done at the program and activities that can be done at home. Sharing this with parents can increase buy-in since they can see a clear path to success with achievable benchmarks and goals that are part of a realistic, structured plan.
9. **Avoid education jargon.** Not everyone is familiar with DRDPs or diagnostic and summative assessments. Avoid overwhelming parents with education lingo. Speak in plain terms, explain what you mean, and ensure parents are clear about the information you present. Encourage parents to ask questions as needed for clarification.
10. **Give parents responsibility.** Early childhood professionals know that children do better when their parents are involved. A perfect way to get parents involved is to ask questions about family life and routines (a family questionnaire is ideal). Families should be encouraged to get involved throughout the school year. For example, they can be special guests and talk about their jobs or read their favorite story to the children. Parents involved early on will be more likely to follow through on their "plan of action" once it is presented at the conference.
11. **Encourage questions.** Approachable professionals build a lasting connection with parents and promote a positive learning experience with their children. Not only do you want your students to feel comfortable enough to ask questions, but you also want your parents to feel they can approach you. Although your time may be limited during the school day, it is important to carve out time and space to discuss important matters with parents. If parents cannot make the conference, offer your email address to allow for some time for a brief "Q&A". NOTE: Hitting parents up at the end of a long work day and rushing through important details regarding their child is NOT recommended.
12. **Don't make assumptions about parents or students.** Avoid relying on stereotypes and allowing personal biases to cloud your judgment. View all parents as partners because, like it or not, they are. Work to make sure that even the most challenging students and parents feel welcomed and a part of the team.
13. **If a parent becomes hostile, don't engage.** No matter how prepared, pleasant, and affirming you are, some parents may become hostile or upset at the conference, especially if there are areas of concern or issues with a child's challenging behavior that must be addressed. Some parents may be used to hearing bad news, others don't trust or have little regard for teachers,

some parents feel a need to defend their child, while others may be upset about a personal matter and may take their frustration out on you. Remain calm! If possible, let the parent vent. Use active listening and listen to the parents' concerns. Discuss how both parties want what's best for the child and reassure them that you have their child's interest at heart. Look for a compromise or strategy that best supports the child and their family. Stay focused on the task at hand – the conference – and reemphasize the positive. Sometimes, a follow-up meeting may need to be scheduled.

14. **Remain professional at all times.** Like parents, you may have an off day and be tempted to stray into an unprofessional area. We may also cross some fine lines and become "friends" with our families. Here are some topics that should never be discussed with families during a conference (or at any time):
    - Speaking negatively about other professionals or colleagues.
    - Comparing two or more students to each other.
    - Discussing another student's behavior, family, or performance.
    - Blaming parents for a child's academic performance or behavior.
    - Arguing or becoming hostile with parents
    - Complaining about school policies or procedures.
15. **Document, document, document.** Because you will meet with several families in the course of a week, it is a good idea to make notes about the conversations and outcomes of the conference. You may need to refer to them at a later time when planning a follow-up meeting or when planning additional curriculum activities. Once in a while, a parent may notify your administrator that they have concerns about the information shared during the conference. Your notes can be shared with your administrator to help see both sides of the conversation.
16. **Stay in contact with parents.** Parents should be able to contact you to follow up or address new concerns. Email is the most convenient way to receive messages and respond to parents, but phone calls or future conferences may be necessary, too. Set the guidelines and boundaries for future communications.

References, Contributors and Attributions

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CHAPTER OVERVIEW

7: Genes and the Environment

7.1: Nature vs. Nurture

7.2: Chromosomes, Genes and DNA

7.3: Genetic Disorders

7.3.1: Single Gene Disorders

7.3.2: Chromosomal Disorders

7.3.3: Multi-factorial Inheritance Disorders

7.4: Genetic Counseling and Testing

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7.1: Nature vs. Nurture

Learning Objectives

1. Explain the concept of nature vs. nurture.
2. Summarize how both heredity and environment interact to shape human development.
3. Differentiate between passive, evocative, and active genotype-environment correlations.
4. Describe the epigenetic framework.
5. Analyze how environmental experiences can influence gene expression and developmental outcomes.

Nature and Nurture

The nature vs. nurture debate has existed for thousands of years, but in the mid-1800s, researcher Francis Galton coined the term "Nature vs. Nurture". The question at its foundation:

> *Does our biological make-up (genes) or the environment we grow up in influence our development and social advancement more?*

The question seemed to be answered in the 1970s when Dr. John Money, a prominent psychologist, published his findings from the John-Joan Case. For years, Dr. Money continued to boast about a successful case study in which nurture proved more important than nature.

Born in 1965 as a biological male, Bruce Reimer suffered irreparable damage to his penis as an infant during a botched circumcision. Since Bruce was an identical twin, Dr. Money approached and encouraged Bruce's parents to have his gender reassigned by undergoing surgery to remove the remains of his external genitalia and construct rudimentary female genitals. Bruce's parents were told to raise him as a girl. Bruce was renamed Brenda.

However, Brenda/David rejected the female identity after puberty and chose to live as a male. It was only then that his mother told him of his biological status. In the late 1990s, David began speaking publicly about his experiences, finally causing others to question Money's methods and results—that environment can outweigh genetic influence.

Today, scientists and researchers agree that the debate is defunct- one does not outweigh the other. It takes both nature (heredity) and nurture (the environment) to influence one's development. 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. Almost all human features are polygenic (a result of many genes) and multifactorial (a result of many genetic and environmental factors). 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 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 potential. And environmental circumstances can trigger symptoms of a genetic disorder.2

Environment Correlations

Environment Correlations refer to how genetic factors contribute to environmental variations (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. Specific 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 have been given the environmental encouragement to engage in these actions.



Figure 7.1.1: Two skiers. Image by Alexey Ruban on Unsplash.

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

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 in stressful environments for genetically at-risk children. [4]

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7.2: Chromosomes, Genes and DNA

Learning Objectives

1. Describe the basic structure and function of genes and chromosomes.
2. Differentiate between genotypes and phenotypes.
3. Explain how dominant and recessive alleles influence inherited traits.
4. Explain the role of sex chromosomes in determining biological sex.
5. Identify key characteristics of polygenic inheritance and incomplete dominance.

Genes and Chromosomes

Now, let's look more closely at 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, which influence the structure and functions of cells. Genes are located on the chromosomes, and according to the Human Genome Project (NIH, 2015), there are an estimated 20,500 genes for humans.

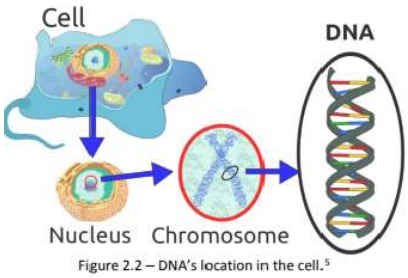


Figure 2.2 – DNA's location in the cell.[5]

Figure 7.2.1: DNA's location in the cell. Image by Radio89 is licensed under CC BY-SA 3.0.

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

However, the cells used in sexual reproduction, called the gametes (sperm or ova), are formed in 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 **7.2.1** - 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 genes between the chromosomes (crossing over) Step 2. Chromosomes make a duplicate Step 3. First cell division Step 4. Second cell division

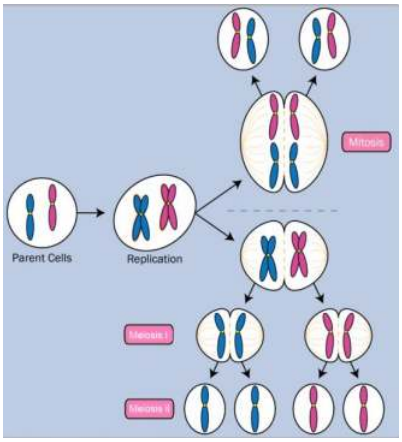


Figure 7.2.2: Mitosis and Meiosis. Image by Community College Consortium for Bioscience Credentials is licensed under CC BY 3.0.

Given the amount of genes present and the unpredictability of the meiosis process, the likelihood of having genetically identical offspring (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 the 23 pairs of chromosomes. Notice the differences between the sex chromosomes in females (XX) and males (XY).

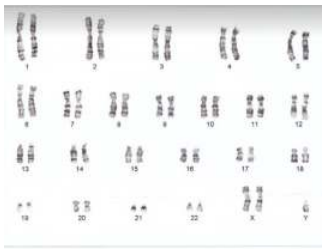


Figure 7.2.3: The 23 pairs of chromosomes. Image by Nami-ja is in the public domain.

Genotypes and Phenotypes & Patterns of Inheritance

Genotype refers to the total of all the genes a person inherits. The word **phenotype** refers to the features that are 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 the 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. In the heterozygous condition, 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 of a 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, nearsightedness, and straight hair.

Most characteristics do not result from a single gene; they are **polygenic**, meaning they result from 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, which is called incomplete dominance. [10]

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SECTION OVERVIEW

7.3: Genetic Disorders

Genetic Disorders

Most of the known **genetic disorders** are dominantly inherited; however, the vast majority of dominantly inherited disorders are not severe 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 they are at greater risk for sex-linked disorders due to a recessive gene, such as hemophilia, colorblindness, and baldness. Females must inherit the recessive gene on both X chromosomes to be affected by recessive genetic defects. However, females are equally at risk if the defective gene is dominant.

Topic hierarchy

7.3.1: Single Gene Disorders

7.3.2: Chromosomal Disorders

7.3.3: Multi-factorial Inheritance Disorders

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7.3.1: Single Gene Disorders

Learning Objectives

1. Differentiate between autosomal recessive and autosomal dominant inheritance patterns.
2. Explain the role of sex-linked inheritance in increasing vulnerability to certain genetic disorders, especially among biological males.
3. Describe how genetic mutations occur during prenatal development.
4. Identify how these mutations can contribute to the variability in the expression of single gene disorders.

Single Gene Disorders

A single gene disorder is caused by one abnormal gene and can occur in one of two ways:

1. By inheriting a pair of recessive alleles from the parents, due to one or both parents being carriers of the disorder.
2. A mutation occurs during cellular division in the prenatal stage of development.

Inheritance of Single Gene 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 due to the dominant gene suppressing the expression of the recessive allele that carries the single gene disorder. If both parents are carriers and the child inherits a pair of recessive alleles, the single gene order is expressed.

In some cases, single gene disorders are expressed because the recessive gene has no pair, so it is the only gene that can be expressed and does not have the possibility of being suppressed by a dominant allele in the pair. The Y chromosome has about 300 genes compared to the X chromosome, which has over 900. The XY chromosomes are our genetic information related to biological sex. In biological males, there is often no pair for many of the genes on the X chromosome to the Y, leaving biological males with an increased vulnerability to many single gene disorders.

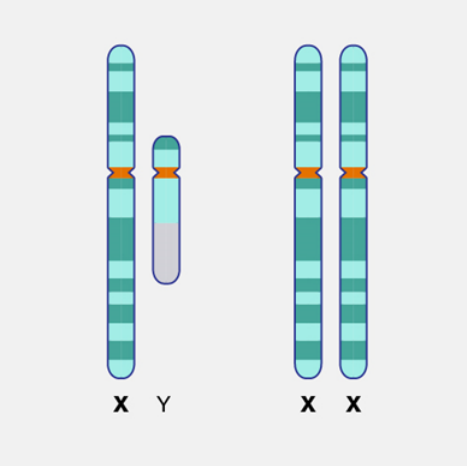


Figure 7.3.1.1: The Y Chromosome. Image by The National Human Genome Research Institute is in the public domain.

Table **7.3.1.1** - Recessive Disorders (Homozygous)

Disorder	Description	Cases per Birth
Red-Green Blindness	A type of color vision deficiency where individuals have difficulty distinguishing between red and green hues. It is caused by a genetic defect that affects the cones in the retina, which are responsible for color detection.	This condition is usually inherited and is linked to a mutation on the X chromosome, making it more common in males than females. 1 in 12 men and 1 in 200 women
Hemophilia	A disorder that impairs the blood's ability to clot properly, leading to excessive bleeding after injury or surgery, and spontaneous bleeding episodes. There are three types of hemophilia: A (Classic), B (Christmas Disease), and C.	Type A affects about 1 in 5,000 male births Type B affects about 1 in 25,000 male births Type C affects both males and females but is much rarer, about 1 in 100,000 births
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
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
Duchenne Muscular Dystrophy	A weakening of the muscles resulting in an inability to move, wasting away, and possible death.	1 in 3500 males

Autosomal Dominant Disorders (Heterozygous)

The individual only needs to inherit the gene change from one parent to have the disorder.

Table 7.3.1.2 - Autosomal Dominant Disorders (Heterozygous)

Disorder	Description	Cases per Birth
Huntington's Disease	A condition that affects the individual's nervous system. Nerve cells become damaged, causing various parts of the brain to deteriorate. The disease affects movement, behavior and cognition. It is fatal and occurs at midlife.	1 in 10,000
Tourette Syndrome	A tic disorder that 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 features.	1 in 15,000-40,000

Mutation

Mutation occurs during the prenatal stage of development when genetic information is undergoing replication or mitosis. A process called deletion can occur. Deletion is when a portion of a chromosome is deleted because proteins are out of order or missing from one step to the next. This can happen when strands of DNA slip or loop out. Mutation is why there are varying degrees of severity and expression of the disorder from individual to individual. Mutation can occur spontaneously or, in most single gene disorders, due to inheriting a mutated allele from both parents (and could also be classified as homozygous).

Table **7.3.1.3** - Recessive Disorders Due to Mutation

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
Tay Sachs Disease	Caused by an enzyme deficiency resulting in the accumulation of lipids in the nerve 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 are carriers 1 in 20 French Canadians are carriers

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7.3.2: Chromosomal Disorders

Learning Objectives

1. Differentiate between autosomal and sex-linked chromosomal disorders.
2. Explain how structural changes and errors during cell division can result in chromosomal abnormalities.
3. Describe the impact of advanced maternal age on chromosomal disorders.

Chromosomal Disorders

A **chromosomal abnormality** occurs when a child inherits too many or too few chromosomes. There are two causes for chromosomal abnormalities:

1. When a chromosome is not in a pair (occurs by chance).
2. There is a change in chromosome structure (occurs by chance or is inherited).

Types of Structural Changes

1. Deletion occurs when part of a chromosome is lost or deleted.
2. Inversion occurs when a section of a chromosome breaks off, flips around, and then reattaches in the opposite direction.
3. Duplication occurs when a section of a chromosome is repeated.
4. Translocation occurs when part of one chromosome breaks off and attaches to another chromosome.

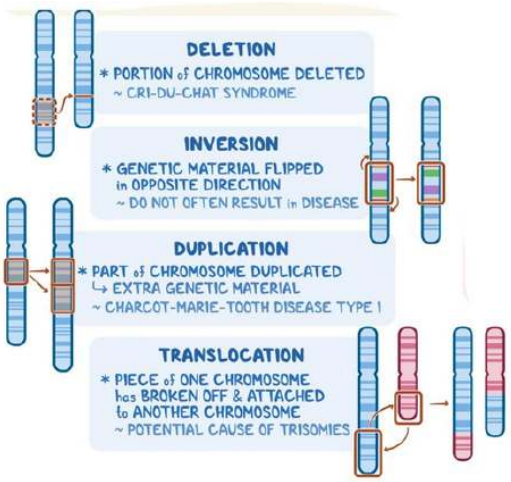


Figure 7.3.2.1: Types of Mutations. Image by kingmaxton8 is in the public domain.

Advanced Maternal Age as a Risk Factor

The most common cause of chromosomal abnormalities is the age of the mother. As the mother ages, egg quality decreases over time, starting around age 32 and decreasing more rapidly after age 37, 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. Close to half of all zygotes are believed to have an odd number of chromosomes. Most of these zygotes fail to develop and are spontaneously aborted by the mother's body.

Autosomal Chromosome Disorders

Autosomal chromosome disorders are caused by autosomal abnormalities, or non-sex chromosomes (the other 22 pairs). The disorder occurs due to too many or too few chromosomes. Here is a table of some autosomal chromosomal disorders:

Table **7.3.2.1** - Autosomal Chromosomal Disorders

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





Figure **7.3.2.2**: Infant boy with Trisomy 9 Mosaicism. Image by Ashley Onken used with permission.

Figure 7.3.2.3: Girl with XXX Syndrome. Image is in the public domain.

Sex-Linked Chromosomal Disorders

Sex-linked chromosomal disorders occur when the abnormality is on the 23rd pair, or the chromosomes that determine a person's biological sex. Here is a table of some sex-linked chromosomal disorders:

Table **7.3.2.2** - Sex-Linked Chromosomal Disorders

Disorder	Description	
Turner Syndrome (XO)	It occurs 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 short stature may be noted.	Affects about 3% of all female babies conceived.
Klinefelter Syndrome (XXY)	It occurs when an extra X chromosome is present in a male's cells 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.	1 in 500-1,000 male births
XYY Syndrome	It occurs when an extra Y chromosome is present in a male's cells. There are a 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.	1 in 1,000 male births
Triple X Syndrome (XXX)	It occurs when an extra X chromosome is present in a female's cells. It may result in being taller than average, learning difficulties, decreased muscle tone, seizures, and kidney problems.	1 in 1,000 female births
Fragile X Syndrome	It occurs when the body cannot make enough of a protein it needs for the brain to grow, causing problems with learning and behavior. It is caused by an abnormality in the X chromosome, which then breaks. If a female has Fragile X, her second X chromosome is usually healthy, but males with Fragile X don't have a second healthy X chromosome. This is why symptoms of Fragile X are usually more serious in males.	1 in 4,000 males 1 in 8,000 females

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7.3.3: Multi-factorial Inheritance Disorders

Learning Objectives

1. Define multi-factorial inheritance disorder (MSID).
2. Explain how MSID differs from single-gene and chromosomal disorders.
3. Identify how both genetic and environmental factors interact to influence the development of complex conditions.
4. Explain the importance of early intervention and lifestyle modifications in mitigating the effects of multi-factorial conditions.

Multi-factorial Inheritance Disorders

Multi-factorial inheritance disorders (MFID) are complex health conditions that result from the interaction between multiple genes (polygenic inheritance) and various environmental factors. Unlike single-gene disorders, where a mutation in one gene leads directly to a condition, multi-factorial disorders arise from the combined effects of numerous genetic variations, each contributing a small amount to the overall risk, as well as lifestyle and environmental influences that shape how these genes are expressed.

These types of conditions are among the most common health concerns across the lifespan and affect millions of individuals worldwide. Studies have identified combinations of genes that contribute to the risk for heart disorders, obesity, type 2 diabetes, and Parkinson's disease (NHGRI, 2020). Because both genetic and environmental components are involved, these disorders often cluster in families, but they do not follow the straightforward Mendelian patterns of inheritance.

Genetic and Environmental Interplay

Environmental exposures—such as diet, physical activity, stress, toxins, and access to healthcare—can either increase or decrease the likelihood that an individual will develop a particular condition. This is why individuals with similar genetic predispositions can experience vastly different health outcomes depending on their environments. For example, someone with a genetic susceptibility to obesity may never develop the condition if they maintain a balanced diet and active lifestyle. Conversely, another person with the same genetic risk may develop obesity due to a sedentary lifestyle and poor nutrition.

Examples of MFIDs

Other multi-factorial inheritance disorders include, but are not limited to:

- Neural tube defects such as spina bifida and anencephaly
- Cleft palate
- Arthritis
- Asthma
- Mental health disorders such as depression, schizophrenia
- Late onset of Alzheimer's disease
- Hypertension

Implications for Early Childhood and Beyond

Because many multi-factorial conditions emerge gradually over time, early monitoring and proactive intervention—especially in early childhood—can help reduce the risk of developing these disorders later in life. For example, encouraging healthy eating, regular exercise, and positive mental health practices during childhood can help mitigate the onset of obesity, diabetes, and even mental health issues. Understanding family history and genetic predispositions can also guide more targeted preventive care.

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7.4: Genetic Counseling and Testing

Learning Objectives

1. Define genetic counseling.
2. Explain the role of genetic counseling in supporting families and children with genetic conditions.
3. Distinguish between genetic screening and diagnostic testing during pregnancy.
4. Describe common prenatal screening and diagnostic procedures.
5. Identify the benefits and limitations of genetic testing for early detection and intervention planning.
6. Discuss ethical considerations regarding prenatal genetic testing, including privacy, consent, and family decision-making.

Genetic counseling is a professional service that provides individuals and families with information about the genetic basis of health conditions and how they may be passed down through generations. For children, genetic counseling can play a critical role in identifying potential genetic disorders early, which can lead to timely interventions and improve long-term health outcomes. Genetic counselors, trained in genetics and counseling, work closely with parents and caregivers to explain genetic risks, inheritance patterns, and the available options for testing and management (National Society of Genetic Counselors [NSGC], 2020).

From the perspective of the developing child, genetic counseling is essential for:

1. **Early Diagnosis and Intervention**: Identifying genetic disorders early can lead to immediate interventions, which may reduce developmental delays or other complications.
2. **Managing Family Planning**: Counseling can help parents understand how a genetic condition might impact future children and offer support for family planning decisions.
3. **Understanding Genetic Risks**: Counseling helps families understand genetic risks in a way that is comprehensible and meaningful, especially when considering how these risks may affect their child's development.

Types of Prenatal Genetic Testing

Genetic prenatal testing can be broadly classified into screening tests and diagnostic tests.

Screenings

Screening tests assess the likelihood of a genetic condition, while diagnostic tests confirm whether the condition is present.

1. **First Trimester Screening**: This test combines blood tests and an ultrasound to assess the risk of chromosomal abnormalities, such as Down syndrome (trisomy 21), trisomy 18, and trisomy 13. The blood test measures the levels of certain substances in the mother's blood. At the same time, the ultrasound looks for specific markers in the fetus, such as the nuchal translucency (fluid at the back of the neck), which may indicate an increased risk of Down syndrome.
2. **Integrated Screening**: A combination of first and second trimester screening tests, integrated screening involves measuring blood markers at both stages of pregnancy. It provides a more accurate risk assessment for conditions such as Down syndrome, trisomy 18, and neural tube defects like spina bifida.
3. **Non-Invasive Prenatal Testing (NIPT)**: NIPT is a blood test that analyzes small fragments of fetal DNA found in the mother's blood. It is highly accurate for detecting conditions like Down syndrome, trisomy 18, and trisomy 13. NIPT can be done as early as the 10th week of pregnancy and is considered more accurate than other screening tests. However, it is still a screening test, and a positive result requires confirmation through diagnostic testing.

Diagnostic Tests

Diagnostic tests provide definitive results and are used when a screening test indicates an increased risk of a genetic condition or when there is a family history of certain disorders. These tests involve taking a sample of fetal cells and examining them for genetic abnormalities.

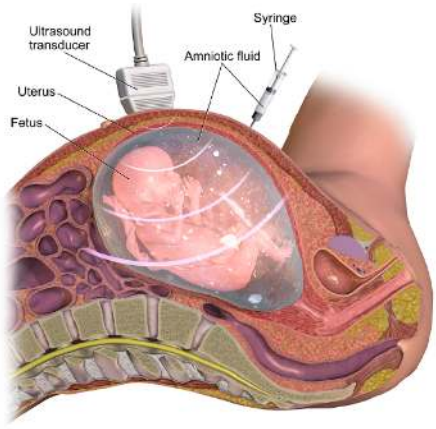


Figure 7.4.1: Amniocentesis. Image by BruceBlaus is licensed CC BY-SA 4.0

1. **Amniocentesis**: Performed between the 15th and 20th week of pregnancy, amniocentesis involves taking a sample of amniotic fluid from the sac surrounding the fetus. The fluid contains fetal cells that can be analyzed for chromosomal abnormalities, such as Down syndrome, and genetic disorders, such as cystic fibrosis. Amniocentesis is highly accurate, with a diagnostic accuracy rate of about 99.4% for detecting chromosomal abnormalities (American Pregnancy Association, 2020).
2. **Chorionic Villus Sampling (CVS)**: CVS is performed between the 10th and 13th week of pregnancy and involves taking a small sample of cells from the placenta (chorionic villi). These cells are tested for genetic conditions such as Down syndrome, cystic fibrosis, and Tay-Sachs disease. CVS has a slightly higher risk of complications compared to amniocentesis, but offers the advantage of being performed earlier in the pregnancy.
3. **Cordocentesis (Percutaneous Umbilical Blood Sampling)**: This is a rare test performed after the 18th week of pregnancy. It involves obtaining a sample of the fetus's blood from the umbilical cord. It is typically used to diagnose blood disorders, such as anemia or infections. However, this test is more invasive and is usually reserved for specific cases.

Benefits of Genetic Testing

Prenatal genetic testing can detect a range of genetic disorders early in pregnancy, including conditions that may affect the child's long-term health. Early identification of disorders allows parents and healthcare providers to plan for the child's care, provide early interventions, and/or make decisions about the pregnancy and how to proceed. This may involve decisions about continuing the pregnancy, preparing for the birth of a child with special needs, or making informed choices about healthcare and future treatments.

For families with a known genetic condition or family history, prenatal genetic testing provides information to make informed decisions about future pregnancies. If a genetic condition is detected, parents may consider options such as preimplantation genetic diagnosis (PGD) with in vitro fertilization (IVF) or consider adoption.

Ethical Considerations in Genetic Testing

Genetic prenatal testing raises important ethical issues, particularly regarding the privacy of results and the rights of children as they grow older. Initially, parents control the genetic information, but as children mature, they may gain the ability to understand and decide how their genetic data is shared. Ethical concerns arise when parents withhold information from the child's early years, as the child may later seek or be exposed to this information. When children reach an age where they can comprehend their genetic results, the question becomes whether they should have the right to consent to disclosing this information, especially if it relates to life-altering conditions. Balancing the child's right to privacy with the parents' role in decision-making is crucial, and genetic counselors can help guide families through these complex conversations while prioritizing the child's emotional and psychological well-being.

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CHAPTER OVERVIEW

8: Prenatal Development

8.1: The Beginnings of Development
8.2: Germinal Stage
8.3: Embryonic Stage
8.4: Fetal Stage
8.5: Health and Risks in Pregnancy
8.5.1: Risk-Factors
8.5.2: Maternal Health
8.5.3: Teratogens

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8.1: The Beginnings of Development

Learning Objectives

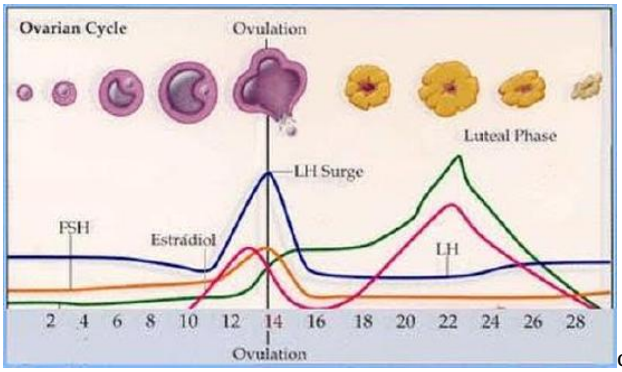
1. Explain the process of meiosis and its role in the creation of gametes.
2. Describe the menstrual cycle and the hormonal changes that trigger ovulation.
3. Define the “fertile window” and explain its significance in relation to conception.
4. Evaluate common questions about conception risk and fertility patterns based on current evidence.

The Beginning

A biological female is born with all the ovum (eggs) she will have- between 1 and 2 million. By the time the female enters puberty, only about 25%, or 300,000, remain. This number steadily declines as she ages. On the contrary, once a biological male reaches maturity, his body is capable of producing sperm. The process responsible for creating ovum and sperm (collectively known as gametes, or sex cells) is meiosis. **Meiosis** is a cellular division process that produces gametes that have 23 chromosomes instead of 46 chromosomes. By reducing the number in half, it ensures that when fertilization of the egg by sperm occurs, the offspring receives the correct number of chromosomes.

Ovulation and Becoming Pregnant

The prenatal stage begins before a woman is even aware of being pregnant. The prenatal journey begins on the first day of the last menstrual period (LMP). This date is what will be used to determine the baby's estimated due date (EDD). An early ultrasound in the first trimester may be used to help confirm EDD. About two weeks before the anticipated next menses, a follicle in a woman's ovary matures and releases an egg into the fallopian tube, where it awaits sperm. The uterine lining also thickens in preparation for the implantation of a fertilized egg. This is called **ovulation**, and only happens once a cycle. While ovulation can be somewhat predicted, it's difficult to say exactly when it will occur. What we do know is that once ovulation has occurred, menses follow 14 days later.



creative

Figure 8.1.1. Menstrual Cycle Chart. Image by Gaboka86 is licensed CC-BY-SA 4.0

In the 24-36 hours preceding ovulation, a chemical called luteinizing hormone (LH) is released, triggering ovulation and supporting the early stages of pregnancy (should it occur). Once the egg is released, it can survive for 12 to 24 hours. Sperm, on the other hand, can live for up to five days in a biological female's reproductive system.

Therefore, intercourse occurring between five days before and 24 hours after ovulation can result in pregnancy. This is referred to as the **fertile window**. For the example below, the fertile window would be Days 8-15. Ovulation typically occurs between days 13 and 14, so the fertile window begins on day 8 and lasts until the day after ovulation (day 15).

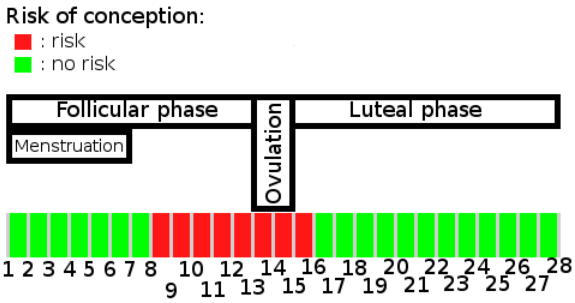


Figure 8.1.2. Risk of Conception. Image by Genetics4good is licensed CC-BY-SA 3.0

Frequently Asked Questions

1. **Can a female get pregnant during her menses?** The short answer is yes, but it is highly unlikely. Ovulation can overlap with menses if she ovulates earlier in the cycle and experiences longer menstrual cycle symptoms.
2. **What are the chances of getting pregnant each cycle?** The literature varies, but most agree that there is approximately a 30-35% chance of conceiving each cycle when no intervention is used.
3. **What happens if a female doesn't use any form of birth control, including the calendar method or condoms?** There is an 85% chance of becoming pregnant within a year.
4. **Do the chances of getting pregnant vary based on the day of intercourse and the timing of ovulation?** Yes. The timing of intercourse, based on when ovulation occurs, does impact the likelihood of conceiving.

Table 8.1.1. Chance of conception by percentage based on the timing of intercourse.

Day	Chance of Conception (%)
5 days before ovulation	~5-10%
4 days before ovulation	~16%
3 days before ovulation	~25%
2 days before ovulation	~27%
1 day before ovulation	~31%
Day of ovulation	~35%
Day after ovulation	~8%

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8.2: Germinal Stage

Learning Objectives

1. Describe the process of ovulation, fertilization, and the outcomes if fertilization does or does not occur.
2. Explain the events that occur during the germinal period, from conception to implantation.
3. Define key terms such as zygote, blastocyst, trophoblast, and embryonic disk.
4. Identify the hormonal changes that occur immediately following conception and how pregnancy is detected.
5. Compare monozygotic (identical) and dizygotic (fraternal) twins in terms of conception and genetic similarity.

Once ovulation has occurred, and the egg is released, it waits in the fallopian tube until one of two things happens:

1. A sperm comes along and the two are united, resulting in fertilization of the egg (conception).
2. If the egg is not fertilized, it moves to the uterus and is absorbed by the body. All pregnancy-sustaining hormones decrease, triggering the system to shed the thickened uterine lining, which results in menstruation 14 days later.

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 egg, the wall becomes hardened 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 8.2.1: Sperm and ovum at conception. Image is in the public domain.

During this time, the organism begins cell division through mitosis. After five days of mitosis, there are 150 cells, which is now called a **blastocyst**. The blastocyst consists of both an inner cell mass and an outer cell mass. The inner group of cells, known as the embryonic disk, will develop into the embryo, while the outer group of cells, referred to as the trophoblast, will form the support system that nourishes the developing organism. This stage ends when the blastocyst fully implants into the uterine wall (U.S. National Library of Medicine, 2015), around 6-12 days after fertilization.

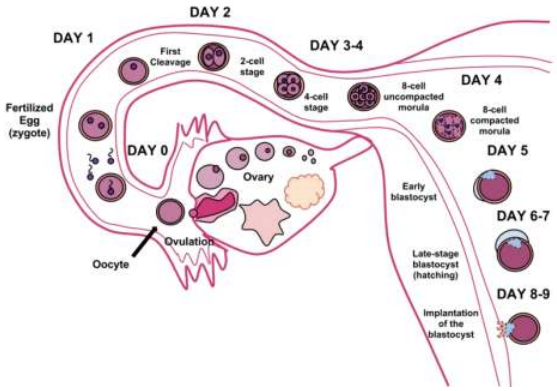


Figure **8.2.2**: The cycle of fertilization. Image by Ttrue12 is licensed under CC BY-SA 3.0

Mitosis is a fragile process, and less than 50% 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. Figure **8.2.2** illustrates the journey of the ova from its release to its fertilization, cell duplication, and implantation into the uterine lining. [22]

Immediately after conception, as the zygote begins its journey, the female body triggers an increase in the production of hormones essential for sustaining pregnancy, including progesterone and human chorionic gonadotropin (HCG). HCG is present in the blood right after conception, but is not immediately detectable in urine. Over-the-counter pregnancy tests look for the presence of HCG in urine samples, which is why a positive result may not occur until at least 9-10, or more, days after ovulation.

Twins

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

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 different genotypes and phenotypes.

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 **8.2.3**: Monozygotic Twins. Image is in the public domain.



Figure **8.2.4**: Dizygotic Twins. Image by Jennifer Paris used with permission.

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8.3: Embryonic Stage

Learning Objectives

1. Define the embryonic period.
2. Identify the stages of embryonic development that occur during prenatal development.
3. Explain the function of the placenta and its connection to the embryo via the umbilical cord.
4. Differentiate between cephalocaudal and proximodistal patterns of growth.
5. Identify the three germ layers.
6. Recognize why the embryonic period is the most vulnerable stage for teratogenic effects.

The Embryonic Period

The embryonic period begins approximately two weeks after conception and lasts until approximately 8 weeks. By the beginning of the third week, the blastocyst has implanted in the uterine wall and is now referred to as an **embryo**, which is supported by two key membranes: the chorion and the amnion. The chorion, formed from the outermost cells of the fertilized egg, facilitates the exchange of nutrients and gases between the mother and developing embryo. The amnion, or innermost membrane, creates the amniotic sac, which fills with fluid to cushion the embryo and provide a stable environment for growth. As development progresses, the chorion and amnion integrate into the placenta.

The **placenta** is a temporary organ that forms during pregnancy and performs essential functions, such as transferring oxygen and nutrients from the mother to the developing organism, and removing waste products like carbon dioxide from the organism's bloodstream and fetal waste later in pregnancy. It is attached to the wall of the uterus and connected to the organism through the umbilical cord.

Growth

During the embryonic period, cells continue to **differentiate** and develop into specialized tissues. 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.

During the embryonic stage, all the major organs and body structures are laid down through a process called **organogenesis**. What was the innermost mass of cells of the trophoblast, differentiated into three layers:

1. **Ectoderm** (outermost layer)- becomes the skin, sense organs, brain, and spinal cord
2. **Endoderm** (innermost layer)- becomes the respiratory system, the digestive system, the liver, and the pancreas
3. **Mesoderm** (middle layer)- becomes muscles, bones, blood, heart, kidneys, and gonads

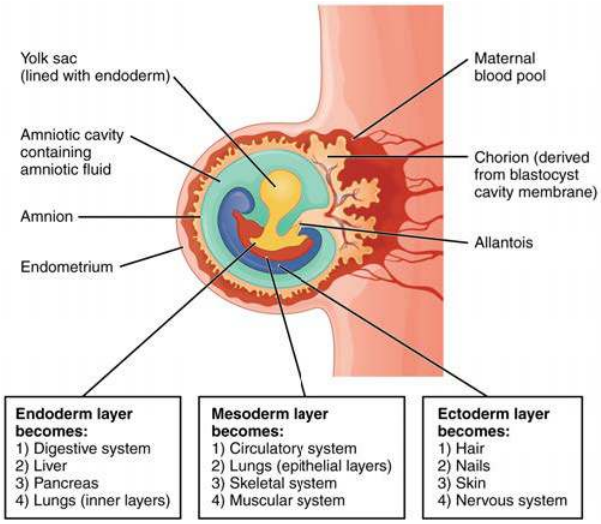


Figure 8.3.1: Germ layers of the embryo. Image by Netha Hussain is licensed CC-BY 4.0

The head develops in the fourth week, and the precursor to the heart begins to pulse (Tan & Lewandowski, 2020). 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 assumes a more human-like appearance. The embryo is approximately 1" 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]



Figure **8.3.2**: A human embryo. Image by Anatomist90 is licensed under CC BY-SA 3.0

About 20% of organisms fail during the embryonic period, usually due to gross chromosomal abnormalities, often before the mother even knows that she is pregnant. The embryonic period is when the developing organism is most vulnerable to the greatest amount of damage if exposed to harmful substances, due to the foundation of all vital systems during organogenesis.

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8.4: Fetal Stage

Learning Objectives

1. Define the fetal period.
2. Identify the beginning and end of the fetal period in prenatal development.
3. Describe the significant physical developments that occur during the fetal period, including organ system maturation.

The Fetal Period

From the ninth week until birth, 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 8.4.1: A human fetus. Image by lunar caustic is licensed under CC BY-SA 2.0

During the 4th to 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 also present at this time. 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 neurons in the brain have developed by 24 weeks, although they are still rudimentary, and the glial cells or nurse cells, which support neurons, continue to grow. At 24 weeks, the fetus can feel pain (Royal College of Obstetricians and Gynecologists, 1997).

Between the 7th and 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 approximately 5 pounds and 7 inches during the last trimester of pregnancy, and by the 8th month, a layer of fat develops under the skin. This layer of fat serves as insulation, helping the baby regulate its body temperature after birth.

At around 36 weeks, the fetus is almost ready for birth. It weighs approximately 6 pounds and measures about 18.5 inches in length. 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]

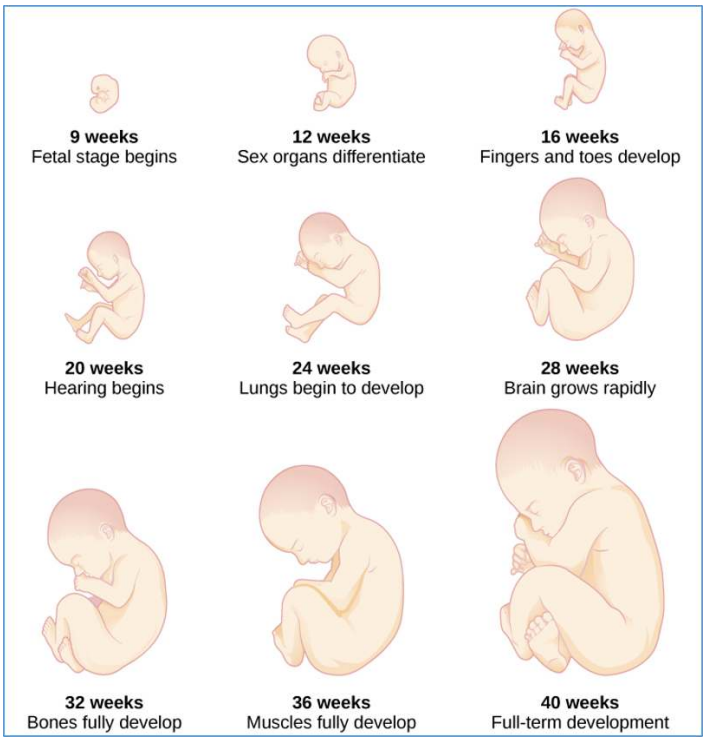


Figure 8.4.2: The development of a fetus. Image by CNX Psychology is licensed under CC BY 4.0

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SECTION OVERVIEW

8.5: Health and Risks in Pregnancy

Trimesters of Pregnancy

Pregnancy typically lasts about 40 weeks, calculated from the first day of the last menstrual period, or about 280 days. However, pregnancy is divided into three trimesters, each lasting about three months, to track the physical and developmental changes in both the mother and the baby. The **first trimester** spans from conception to 12 weeks, the **second trimester** from 13 to 26 weeks, and the **third trimester** from 27 weeks until birth. These divisions focus on maternal symptoms and fetal growth milestones. In contrast, prenatal stages—**germinal, embryonic, and fetal stages**—are based on biological development and are used to describe the developing organism in greater detail.

Gestational Age

Most mothers-to-be will keep track of the age of a pregnancy, or **gestational age**. Gestational age is also used to determine the timing of prenatal assessments, assess milestones, track fetal growth, and make delivery decisions as needed. It is common to hear vocabulary related to gestational age and how the pregnancy may be classified, particularly if early delivery occurs, due to the types of interventions that may be necessary to ensure the best outcomes for the baby.

Table **8.5.1**: Gestational Age and Pregnancy Classification

Classification	Gestational Age	Description
Micropreemie	Less than 26 weeks	Babies born at extremely early gestational ages require advanced medical care and have high risks.
Very Preterm	26-31 weeks	Babies born significantly early often face developmental challenges and require intensive medical support.
Moderate Preterm	32-33 weeks	Babies born moderately early typically need some neonatal care.
Late Preterm	34-36 weeks	Babies born close to term may still face challenges like jaundice or feeding issues.
Early Term	37-38 weeks, 6 days	Babies born just before full term are generally healthy but may have a slightly higher risk of complications.
Full Term	39-40 weeks, 6 days	Optimal timing for delivery; babies are fully developed and have the best outcomes for health and growth.
Late Term	41 weeks - 41 weeks, 6 days	Babies born slightly past their due date are typically healthy but monitored for signs of complications.
Postterm	42 weeks or more	Babies born well past the due date may face risks like reduced amniotic fluid or larger birth weight.

Prenatal Assessment

A number of assessments are suggested for 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,

screening, and diagnostic tests for birth defects.



Figure **8.5.1**: A woman receiving an ultrasound. Image by MedicalPrudens is licensed under CC0 1.0.

Ultrasound is one of the primary screening tests used in conjunction 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 determine the age of the fetus, the location of the placenta, the fetal position, movement, breathing, and heart rate, as well as the amount of amniotic fluid in the uterus and the 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, which are later tested.

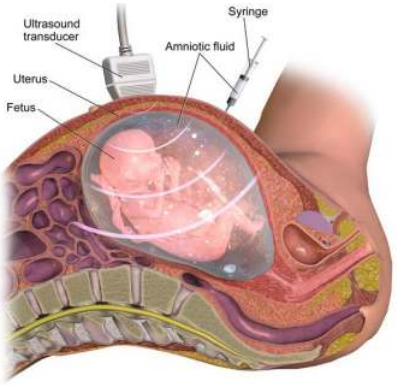


Figure **8.5.2**: Amniocentesis. Image by BruceBlaus is licensed under CC BY-SA 4.0.

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

Complications of Pregnancy

There are a number of common side effects of pregnancy. Not everyone experiences all of these, nor to the same degree. Although they are considered minor, this does not mean 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.

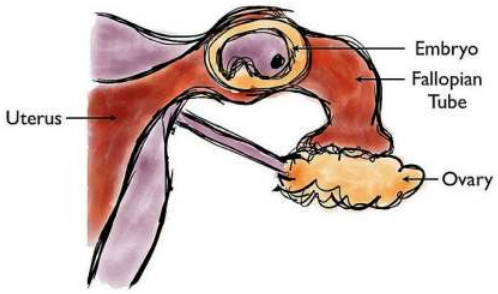


Figure 8.5.3: An ectopic pregnancy. Image by Takatakatakumi is licensed under CC BY-SA 3.0.

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

Preeclampsia, also known as **Toxemia**, is characterized by a sharp rise in blood pressure, protein leakage into the urine due to 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 typically involves bed rest and, in some cases, 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 remote areas and the training of more midwives to assist in childbirth.[63]

Infertility and Building Families

Infertility

When a couple has failed to conceive a child in a year, they receive the diagnosis of infertility. Infertility affects about 10 to 15 percent of couples in the United States (Mayo Clinic, 2015). Male factors create infertility in about a third of the cases. For men, the most common cause is a lack of sperm production or low sperm production.

Female factors cause infertility in another third of cases. For women, one of the most common causes of infertility is the failure to ovulate. Another cause of infertility in women is Pelvic Inflammatory Disease (PID), which is an infection of a woman's reproductive organs (Carroll, 2007).

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

Options for Building Families

There are numerous options for pursuing 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) is a type of artificial insemination that 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 occurs outside the body, and the fertilized egg is reinserted into the woman's reproductive tract through a procedure called embryo transfer. [67]



Figure **8.5.4**: The IVF process. Image by Manu5 is licensed under CC BY-SA 4.0.

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

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

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

Family Built with Surrogacy



Figure **8.5.5**: This same-sex couple used a surrogate. Photo by Daryn Crawford used with permission.

Family Built through Adoption



Figure **8.5.6**: This single mother adopted her daughter. Photo by Michaela Szidloski used with permission.

Topic hierarchy

8.5.1: Risk-Factors

8.5.2: Maternal Health

8.5.3: Teratogens

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8.5.1: Risk-Factors

Learning Objectives

1. Identify maternal health risks associated with pregnancy after age 35.
2. Summarize the potential paternal influences on prenatal development, including age-related risks and occupational or environmental exposures.

Maternal Factors

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



Figure 8.5.1.1: A pregnant woman relaxing in a tub. Image by Thomas Pompernigg is licensed under CC BY-SA 2.0.

Mothers over 35

Most women over the age of 35 who become pregnant and are in good health have healthy pregnancies. However, according to the March of Dimes (2016), 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 generally more confident, less stressed, and typically married, which provides 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 of having pregnancy complications, including anemia and high blood pressure. These risks are even greater for individuals under the age of 15. Infants born to teenage mothers have a higher risk of 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 a 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.

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 (a 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 et. al, 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 secondhand smoke for their developing offspring. As noted earlier, smoking by either the mother or around the mother can hinder prenatal development. [57]

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8.5.2: Maternal Health

Learning Objectives

1. Identify and define the most common risk factors, potential effects on the mother and fetus, and how each is managed during pregnancy.

Gestational Diabetes

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



Figure \(\PageIndex{1}\): A gestational diabetes kit. Image by Jessica Merz is licensed under CC BY 2.0.

Most pregnant women have their glucose level tested between 24 and 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), which is 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 a healthy diet and maintaining a healthy weight during pregnancy can reduce the risk 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 is the same.

High Blood Pressure (Hypertension)

Hypertension is a condition in which the pressure against the walls 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 **8.5.2.2**: A woman having her blood pressure taken. Image by rawpixel on Unsplash.

According to the March of Dimes (2015b), 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 from their blood. 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 a 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 begins to produce antibodies to combat what it perceives as 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, the first Rh-positive baby is often not harmed. However, as the mother's body continues to produce antibodies to the Rh factor throughout her lifetime, subsequent pregnancies can pose a greater risk to 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 the March of Dimes (2016), during pregnancy, most women require only an additional 300 calories per day to support 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. Gaining weight slowly is best. Mothers who are concerned about their weight gain should talk to their healthcare provider.

Table 8.5.2.1: Weight Gain during Pregnancy

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

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 of health problems. Stress-related hormones may cause these complications by affecting a woman's immune system, 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 during 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, 2012).

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 the year after pregnancy (March of Dimes, 2015c). 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 healthcare provider, as some medications can cause harm to the developing fetus.

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8.5.3: Teratogens

Learning Objectives

1. Define teratogens and explain their role in prenatal development.
2. Identify key factors that influence teratogenic impact, including timing, dosage, genetics, and fetal sex.
3. Describe major categories of teratogens (e.g., infections, drugs, environmental toxins).
4. Identify common examples of teratogens.

Teratogens

Good prenatal care is essential to protect against maternal and fetal/infant mortality and birth complications. The embryo and fetus are most at risk for some of the most severe problems during the first three months of development. Unfortunately, this is a time at which many mothers are unaware that they are pregnant. Today, we are aware of many factors that can compromise the health of the developing child. The study of factors that contribute to birth defects is called teratology. **Teratogens** (pronounced tara-tow-genz) are environmental factors that can contribute to birth defects, and include some maternal diseases, pollutants, drugs, and alcohol.

Factors Influencing Prenatal Risks

Several considerations are involved in determining the type and amount of damage that may result from exposure to a particular teratogen (Berger, 2005). These include:

- **The timing of exposure:** Structures in the body are most vulnerable to 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 an embryo is exposed 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:** The genetic makeup also plays a role in the impact a particular teratogen may 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]

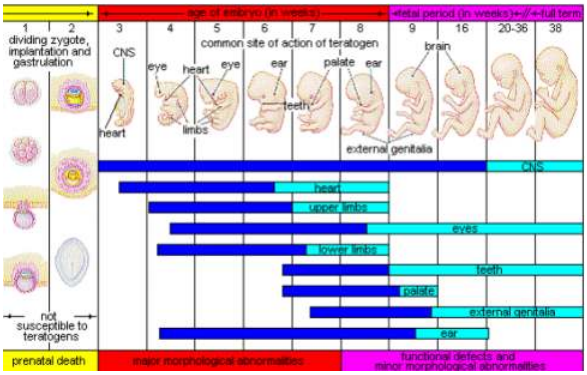


Figure 8.5.3.1: The development of an embryo into a fetus. Image by Laura Overstreet is licensed under CC BY-NC-SA 3.0

Categories of Teratogens

Physical teratogens

These could be saunas, hot tubs, or fevers 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. Physical teratogens may also include exposure to radiation.

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.

Table 8.5.3.1: 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 foodborne illness. Congenital infection can cause miscarriage, stillbirth, premature labor, and neonatal sepsis. [51]

Drugs and chemicals

When pregnant females ingest or absorb these, they may cause a variety of different effects based on the 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 potential teratogens, the following tables examine the effects of various 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 8.5.3.2: Drugs as Teratogens

Teratogen	Potential Effects
Caffeine	Moderate amounts of caffeine (200 mg, equivalent to approximately 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 result 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, stillbirth, 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, which 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 certain vitamins, little is known about the use of herbal or dietary supplements during pregnancy. 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]

Environmental pollutants

Environmental teratogens are substances or factors in the environment that can interfere with fetal development during pregnancy.

Table **8.5.3.3**: Environmental Teratogens

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



Figure **8.5.3.2**: A USDA employee pouring hazardous chemicals into a storage container. Image by USDA is in the public domain.

Table **8.5.3.4**: Teratogens from Animals/Pets

Teratogen	Potential Effects
Toxoplasmosis	This parasite can be transmitted 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	Rodents, including mice, hamsters, and guinea pigs carry this virus. 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]

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CHAPTER OVERVIEW

9: Birth, the Newborn, and the Transition to Parenthood

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

9.1: Preparing for Childbirth

9.2: Childbirth

9.3: The Newborn

9.3.1: Risks to the Newborn

9.3.2: The Newborn's Capabilities

9.4: Parenthood

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9.1: Preparing for Childbirth

Learning Objectives

1. Differentiate among various childbirth preparation methods.
2. Compare and contrast hospital births, birthing centers, and home births.
3. Describe the roles of certified nurse-midwives, licensed midwives, doulas, and birth coaches.

Prepared childbirth refers to being not only in good physical condition to help provide a healthy environment for the baby to develop, but also to help individuals prepare to accept their new roles as parents. Additionally, parents can receive information and training that will help them deliver and care for their 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 for their child's arrival. The following table describes a few of these:

Table **9.1.1**: Approaches to Childbirth

Method	Description
The Lamaze Method	The emphasis of this method is on teaching the woman to be in control during the delivery process. 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 accompanies the mother through the training process 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 techniques, as well as the importance of family support and education.
Bradley Method	"The Bradley Method focuses on preparing the mother for a natural childbirth coached by her partner. They learn techniques to reduce the perception of pain and stay relaxed. The emphasis is on being prepared for an unassisted vaginal birth without medication." [2]
Alexander Technique	This is a technique that can be used during childbirth that involves training to stop habitual reactions to pain, such as tensing muscles, and increase conscious awareness and control over posture and movement. This involves being able to move freely and stay upright during labor and using body positioning that is beneficial to the labor process.[3]
Waterbirth	Involves immersion in warm water. Proponents believe this method is safe and provides many benefits for both mother and infant, including pain relief and a less traumatic birth experience for the baby. However, critics argue that the procedure introduces unnecessary risks to the infant, such as infection and water inhalation.[4]
Lotus Birth	Or umbilical cord nonseverance – UCNS, is the practice of leaving the umbilical cord uncut after childbirth so that the baby is left attached to the placenta until the cord naturally separates at the umbilicus. This usually occurs within 3–10 days after birth. The practice is performed mainly for spiritual purposes of the parents, including for the perceived spiritual connection between placenta and newborn.[5]
Silent Birth	Sometimes known as quiet birth, it 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]
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]

Table 9.1.1 adapted from Lifespan Development: A Psychological Perspective (page 59) by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0; Lifespan Development - Module 3: Prenatal Development by Lumen Learning references Psyc 200 Lifespan Psychology by Laura Overstreet, licensed under CC BY 4.0



Figure 9.1.1: Expectant parents in a childbirth preparation class. Image by liz.schrenk is licensed under CC BY-NC-ND 2.0,

Choosing Location of Childbirth & Who Will Deliver

"In the United States, 98.3% of patients give birth in hospitals, 1.1% give birth at home, 0.5% give birth in freestanding birth centers, and the remaining 0.1% in other places, including physician offices, clinics, cars, etc." (Grünebaum et al., 2023, p. S965).

Hospitals



Figure 9.1.2: Hospitals are the preferred choice of expectant mothers, as they have access to advanced medical technology and a variety of healthcare professionals. Image by UM Health System is licensed CC BY-NC-SA 2.0.

Women often choose to deliver in hospitals due to the access to advanced medical technology and the presence of skilled healthcare professionals, which can provide reassurance and immediate care in case of complications (Declercq et al., 2020). Hospitals also offer pain management options, such as epidurals, and specialized neonatal care for high-risk pregnancies or premature infants (Martin et al., 2019). However, hospital deliveries may come with drawbacks, including higher costs and a more medicalized birthing experience, which some women feel limits their autonomy and ability to follow a birth plan (Vedam et al., 2018). Additionally, hospitals can have restrictive policies on movement, eating, or the number of support persons allowed during labor, which may detract from the comfort and personal experience some women desire (Declercq et al., 2020).

Birthing Centers

Birthing centers provide a middle ground between hospital and home births, offering a more homelike environment with fewer medical interventions while maintaining access to professional care. Attended by certified nurse-midwives, licensed midwives, or occasionally family physicians, these centers focus on low-risk pregnancies, making them ideal for women with uncomplicated health histories and minimal risk factors (Stapleton et al., 2013).



Figure 9.1.3: Birthing centers offer a more home-like feel while still maintaining access to professional care. Image by Bec Plumbe is licensed CC BY-NC-SA 2.0.

A **Certified Nurse-Midwife (CNM)** is a registered nurse with advanced training in midwifery, certified to provide care during pregnancy, childbirth, and beyond. They typically work in hospitals but may also attend births at birthing centers or homes. CNMs can prescribe medications and handle some complications, making them ideal for low- to moderate-risk pregnancies. Alternatively, a **Licensed Midwife (LM)** specializes in natural, low-risk births, often at homes or birthing centers. They are trained in midwifery but are not nurses and cannot prescribe medications. LMs focus on holistic care and transfer patients to doctors if complications arise.

A key advantage of birthing centers is the emphasis on personalized care, autonomy in birthing choices, and a natural birth experience without routine interventions (Walker et al., 2020). However, they are not equipped to handle emergencies requiring advanced medical intervention, which may necessitate transfer to a hospital (Stapleton et al., 2013). This limitation makes them less suitable for high-risk pregnancies involving conditions like preeclampsia, multiple births, or previous cesarean deliveries. Despite these drawbacks, birthing centers remain a preferred choice for women seeking a balance between safety and a less medicalized birth.

Doulas and Birth Coaches

In addition to physicians and midwives, doulas and birth coaches are non-medical professionals who provide physical, emotional, and informational support to women throughout the childbirth process, from before conception to after childbirth. Women often choose to use doulas for personalized, continuous care and advocacy during labor, particularly when seeking a more empowering and less stressful birth experience (Gruber et al., 2013).



Figure 9.1.4: Doulas assist expectant mothers through various non-medicated pain management techniques. Image by Agencia Senado is licensed CC BY 2.0.

Doulas assist by offering techniques for pain management, such as breathing exercises, massage, and positioning, and by facilitating communication between the birthing person and healthcare providers to ensure their preferences are respected (Bohren et al., 2017). **Birth coaches**, who may overlap with the role of doulas, focus on mental preparation, providing guidance and emotional support to help women and their partners feel confident and informed about the birthing process. Studies have shown that having a doula or birth coach can lead to improved outcomes, including shorter labor, reduced need for medical interventions, and higher satisfaction with the birth experience (Gruber et al., 2013).

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9.2: Childbirth

Learning Objectives

1. Describe the physiological and hormonal processes that initiate labor.
2. Identify and explain the three stages of vaginal childbirth.
3. Compare and contrast medical interventions used during labor and delivery.
4. Identify common signs of labor onset.
5. Summarize how cultural values influence childbirth practices.

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 before the onset of true labor, this plug loosens and is expelled, along with a small amount of blood.

As labor nears, the mother's 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 further increases prostaglandins.

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

The first stage of labor consists of three phases: early labor, active labor, and transitional 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, and effaces, or thins out, to accommodate dilation. 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 (ACOG, 2020).

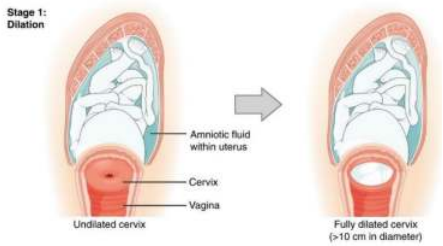


Figure 9.2.1: Early cervical dilation. Image by OpenStax is licensed under CC BY 3.0

Phase 1: Early labor

In early labor, uterine contractions signify that labor has begun. These contractions may initially last about 30 seconds and be spaced 5 to 20 minutes apart. Pain during the early labor phase differs from woman to woman, but many report contractions not being too painful (Low & Moffat, 2020). It is recommended to spend this phase of the first stage at home, resting or engaging in light activity. 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 (ACOG, 2020).

Table **9.2.1**: Early labor

Contraction Timing	Cervical Dilation	Duration of phase
30-60 seconds	up to 4 or 5	6-12 hours on average, but can last more than 24 hours

Phase 2: Active labor

Once contractions increase in duration and frequency to more than a minute in length and about 3 to 4 minutes apart, the woman is considered to be in active labor. Typically, doctors advise that they be called when contractions occur every 5 minutes. Hospitals and birth centers vary in how active labor is defined for admission - some define it as when the cervix has dilated to 4 or 5 centimeters, while others assess based on dilation, effacement, contractions, and pregnancy classification. It is during active labor that a woman may feel the need for pain medication or may use techniques to help her deal with the pain. Active labor lasts, on average, between 3 and 8 hours (ACOG, 2020).

Table **9.2.2** : Active labor

Contraction Timing	Cervical Dilation	Duration of phase
• 60+ seconds in length • occurring at least every 5 minutes	from 4/5 cm to 7 cm	between 3 and 8 hours

Phase 3: Transition

Transition labor is the final phase of the first stage of labor, marking the shift from active labor to the second stage. It begins when the cervix dilates from 7 to 10 centimeters in diameter. During this intense phase, contractions become very strong, frequent, and close together, often occurring every 2 to 3 minutes and lasting 60 to 90 seconds each. These contractions may feel overwhelming and are accompanied by pressure in the lower back or pelvis as the baby moves into position for delivery. Transition labor is often considered the most challenging part of labor but is also the shortest, typically lasting between 15 minutes and 3 hours (ACOG, 2020).

Table **9.2.3** : Transitional labor

Contraction Timing	Cervical Dilation	Duration of phase
• 60-90 seconds in length • occurring every 2-3 min	from 7 to 10 cm	15 minutes to 3 hours

The Second Stage

The passage of the baby through the birth canal is the second stage of labor. This stage typically lasts between 10 and 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 pass through, followed by the other shoulder. The rest of the baby passes through quickly. At this stage, an episiotomy, or incision made in the tissue between the vaginal opening and anus, may be performed to avoid tearing the tissue of the back of the vaginal opening (Mayo Clinic, 2016). The baby's mouth and nose are suctioned out. The umbilical cord is clamped and cut. [12]

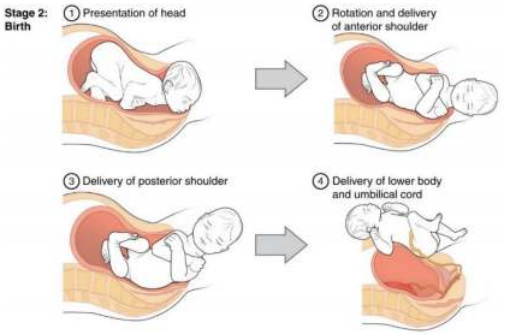


Figure 3.3 - Full dilation and expulsion of the newborn.[13]

Figure 9.2.2: Full dilation and expulsion of the newborn. Image by OpenStax is licensed under CC BY 3.0

The Third Stage

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

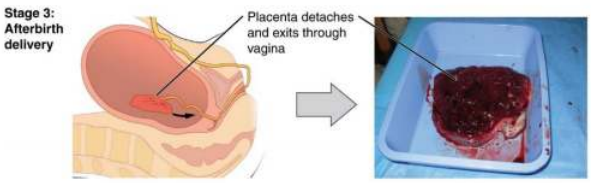


Figure 9.2.3: Delivery of the placenta and associated fetal membranes. Image by OpenStax is licensed under CC BY 3.0.

Additional Considerations

More than 60% of women giving birth at hospitals use an epidural anesthesia during delivery (ACOG, 2020a). 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 9.2.4: Natural childbirth. Image by U.S. Army Alaska is licensed under CC BY 2.0

Women can also use alternative positions (including standing, squatting, being on hands and knees, and using a birthing stool) during labor and even deliver 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 various reasons when there is concern for the health of the mother or the 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 wholly, 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 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 **9.2.5**: A woman receiving a C-section. Image by Tammra M is licensed under CC BY 2.0



Figure 9.2.6: A baby being delivered by C-section. Image by Patricia Prudente on Unsplash

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

Cultural Considerations

Although childbirth is a universal biological event, cultural practices surrounding the birth process can differ significantly across societies. In many cultures, birth is not solely a medical procedure but also a deeply symbolic and communal experience. For example, some Indigenous and African cultures prioritize home births with traditional birth attendants, incorporating rituals and ceremonies that mark spiritual and familial milestones (Davis-Floyd, 2003). In contrast, in many Western societies, the medicalization of childbirth is common, with hospital births and medical interventions such as epidurals and cesarean sections being emphasized (Rothman, 2003). These varying approaches reflect different cultural values about health, medicine, and the role of technology in birth.

Cultural beliefs also influence the support systems during labor and the roles of family members. In certain Asian cultures, it is common for the extended family to be present during childbirth, with an emphasis on maintaining harmony and balance throughout the process (Kleinman & Benson, 2006). On the other hand, in some Western and European cultures, the presence of the father or partner during labor is often encouraged, while in other cultures, it may be restricted or discouraged (Grotevant, 2011). Additionally, postpartum practices, such as dietary restrictions and the prescribed length of rest, vary widely across cultures. These cultural differences highlight how the childbirth experience, although universally shared, is shaped by distinct social norms, practices, and beliefs.

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SECTION OVERVIEW

9.3: The Newborn

Learning Objectives

1. Describe the typical physical characteristics of newborns.
2. Identify and explain the purpose of newborn assessments.
3. Summarize variations in newborn appearance.



Figure 9.3.1: A new mother holding her newborn. Image by the U.S. Air Force is in the public domain

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% of their body weight as they eliminate waste and adjust to feeding. This often goes unnoticed by most parents, but can be a 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 9.3.2: A newborn being weighed. Image by Trei Brundrett is licensed under CC BY-SA 2.0

Body Proportions

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

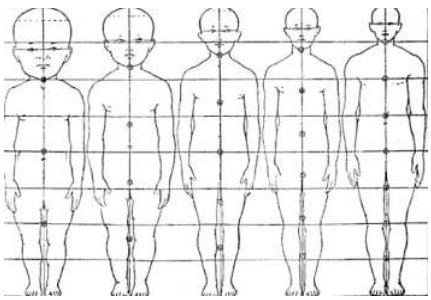


Figure 9.3.3: Body proportions from infancy to adulthood. Image is in the public domain.

Brain Development

Some of the most dramatic physical change that occurs during this period are in the brain. At birth, the brain is approximately 25 percent of its adult weight, a characteristic unique to the brain among all other parts of the body. While most of the brain's 100 to 200 billion neurons are present at birth, they are not fully mature. Over the next several years, dendrites, or the connections between neurons, will undergo a period of transient exuberance, characterized by 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 typically returns 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. Among 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 **9.3.4**: Lanugo on the shoulder and back of twin girls. Image is in the public domain.



Figure 9.3.5: A newborn baby covered in vernix. Image by Upsilon Andromedae is licensed under CC BY 2.0.

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

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



Figure 9.3.6: The clamping and cutting of a newborn's umbilical cord. Image by NNethala is licensed under CC BY-SA 3.0.

Newborns lose many of the above physical characteristics quickly. Thus, older babies look very different. While older babies are often considered "cute," newborns can be perceived as "unattractive" by the same criteria, and first-time parents may need to be educated on this aspect. [36]

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 gently touching the baby's palm), reflex response (the Babinski reflex is tested), and skin color. A score of 0 to 2 is given on each feature examined. An Apgar score of 5 or less is cause for concern. The second Apgar score should indicate improvement with a higher score. [22]

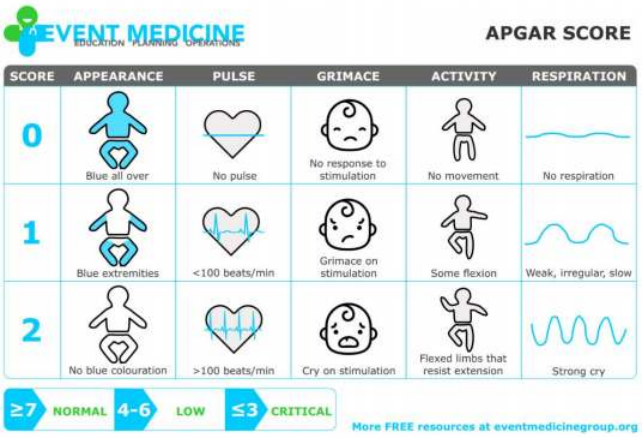


Figure 9.3.7: The Apgar assessment. Image by Event Medicine Group is licensed CC BY 4.0.

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 worldwide to further assess newborns, especially those with low Apgar scores, and to make comparisons between 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 congenital disorders, or conditions that are present at birth. In California, newborns are now screened for 80 different genetic and congenital disorders.



Figure 9.3.8: A medical professional performing the heel stick test. Image by the U.S. Air Force is in the public domain.

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

9.3.1: Risks to the Newborn

9.3.2: The Newborn's Capabilities

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9.3.1: Risks to the Newborn

Learning Objectives

1. Describe common medical complications of the newborn period.
2. Differentiate between preterm, small-for-date, and postmature infants.
3. Identify causes and risk factors for stillbirth and Sudden Infant Death Syndrome (SIDS).

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 (Centers 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, 2015b). 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 body 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 **9.3.1.1**: A premature baby on CPAP in the NICU. Photo by Jennifer Paris used with permission.

Small-for-Date Infants

Infants who have birth weights that are below expectation based on their gestational age are referred to as **small-for-gestational-age**. 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 has been adversely affected. Regev et al. (2003) found that small-for-date infants died at rates more than four times higher than other infants.



Figure **9.3.1.2**: This baby was born at 32 weeks and only weighed 2 pounds and 15 ounces. Photo by Jennifer Paris used with permission.

Postmature

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

Stillborn

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

Sudden Infant Death Syndrome (SIDS)

Sudden Infant Death Syndrome (SIDS) is the unexpected and unexplained death of an otherwise healthy infant, typically occurring during sleep. While the exact cause of SIDS remains unclear, research has identified several risk factors related to newborn health that can contribute to its occurrence.

- Newborns with *low birth weight* (less than 5 pounds, 8 ounces) or who are *born prematurely* (before 37 weeks of gestation) face an increased risk of SIDS. These infants often have underdeveloped respiratory and cardiovascular systems, which can lead to difficulties in regulating breathing and heart rate during sleep (Horne et al., 2015).
- Additionally, premature and low-birth-weight infants may have *immature brainstem development*, which affects the ability to arouse from sleep and respond to low oxygen levels, a critical protective mechanism against life-threatening events during sleep (Kinney et al., 2009).
- *Respiratory infections* may impair breathing, especially during sleep, while *undiagnosed metabolic disorders* can interfere with energy production and other essential bodily functions, making an infant more vulnerable to sudden death (Moon, 2016).

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9.3.2: The Newborn's Capabilities

Learning Objectives

1. Identify and describe the distinct states of sleep and wakefulness.
2. Identify common neonatal reflexes.
3. Summarize newborn sensory capacities.
4. Explain the implications of research on prenatal learning for understanding early parent-child attachment.

Infant States

Newborns regulate their interactions with the world by cycling through distinct sleep and awake states. These states serve to balance stimulation, support development, and communicate needs. There are two primary sleep states—**quiet sleep** and **active sleep**—and four awake states: **drowsy**, **quiet alert**, **active alert**, and **crying**. Each state has unique characteristics and durations, shaping the infant's behavior and engagement.

Sleep

A newborn typically sleeps approximately 16-18 hours per 24-hour period, with half this time spent in active sleep and the other half in quiet sleep. The infant sleeps in several periods throughout the day and night, which means they wake up often throughout the day and night. (Salkind, 2005). [37]



Figure 9.3.2.1: An older newborn baby. Image by brytny.com on Unsplash.

Active Sleep

Active sleep, also known as rapid eye movement (REM) sleep, is a lighter sleep state in which the baby is more physically active. During active sleep, the infant may show facial twitches, brief limb movements, and irregular breathing, and their eyes may flutter under closed lids. This state is essential for brain development and processing sensory experiences, as it allows for the consolidation of what has been learned. Active sleep typically precedes wakefulness as part of the sleep-wake cycle.

Quiet Sleep

Quiet sleep, also known as non-rapid eye movement (NREM) sleep, is a restorative state characterized by deep sleep and minimal movement. In this state, newborns are less responsive to external stimuli, their breathing is slow and regular, and their facial expressions are relaxed. Quiet sleep is crucial for physical growth and brain development, as it enables the body to conserve energy and facilitates cellular repair.

Awake States

Drowsy

In the drowsy state, infants are transitioning between sleep and wakefulness. They may exhibit heavy-lidded eyes, slow movements, and irregular breathing patterns. This state often leads to either sleep or more alert behavior, depending on stimulation levels. Caregivers can use soothing techniques to help the baby drift into sleep from this state.

Quiet Alert

The quiet alert state is characterized by newborns being awake, calm, and most receptive to interaction. Their eyes are open and focused, breathing is steady, and movements are minimal. This is an ideal time for bonding and sensory engagement, as the infant

is actively taking in their surroundings. Newborns spend 2 to 3 hours per day in this state.



Figure 9.3.2.2: Infants experience quiet alert phases where they are focused and calm, so that they may actively take in their surroundings. Image by Oss Leos on Pexels.

Active Alert

During the active alert state, infants are awake but more physically active and less focused. They may exhibit jerky movements, irregular breathing, and brief fussiness. This state often signals increasing stimulation or discomfort and may lead to crying if the infant's needs are not addressed promptly.

Crying

Crying is the newborn's primary means of communication and typically indicates a need for attention, such as hunger, discomfort, or the need for soothing. During crying episodes, infants exhibit increased activity, red or flushed faces, and rhythmic or escalating vocalizations. Crying is a highly stimulating state for both newborns and caregivers. On average, newborns spend about 1-2 hours per day crying, though this varies widely among infants, particularly during the first few weeks of life when "fussy periods" are common.

Reflexes

Newborns are equipped with several **reflexes**, which are involuntary movements triggered by stimulation. Some of the more common reflexes, such as the sucking reflex and the rooting reflex, are crucial for feeding. The grasping and stepping reflexes are eventually replaced with 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 9.3.2.3: A newborn gazing up at a parent. Image is in the public domain.

Hearing

The infant's sense of hearing is remarkably keen at birth, and the ability to hear is evident as early 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 particularly sensitive to the frequencies of sounds in human speech and tend to prefer the exaggeration of infant-directed speech, which will be discussed later. Newborns also prefer their mother's voice 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 had read to them while they were in the womb, based on how fast they sucked on their pacifiers. They showed a preference for the stories their mothers read to them while they were in the womb. [42]



Figure **9.3.2.4**: A collection of children's books. Image by kamiel79 on pixabay.

Touch and Pain

Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013). Newborns who are circumcised, which is the surgical removal of the foreskin of the penis, without anesthesia experience pain as demonstrated by increased blood pressure, increased heart rate, decreased oxygen in the blood, and a surge of stress hormones (United States National Library of Medicine, 2016). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, many circumcisions are now done with the use of local anesthetics.

Taste and Smell

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

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



Figure **9.3.2.5**: A baby sucking on a pacifier. Image by Beeki is licensed under CC0 1.0.

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9.4: Parenthood

Learning Objectives

1. Define the fourth trimester.
2. Describe the physical, emotional, and psychological adjustments experienced by mothers during the postpartum period.
3. Differentiate between the “baby blues” and postpartum depression
4. Explain the evolving role of fathers in prenatal and postnatal care.
5. Identify common challenges that couples face during the transition to parenthood.

The postpartum period, often referred to as the "fourth trimester", marks the transition to parenthood. The transition to parenthood is one of the most profound life changes individuals and couples experience. It involves redefining identities, relationships, and responsibilities as they adapt to the arrival of a new baby.

Becoming Parents

Motherhood

The journey of becoming a mother begins with the physical and emotional changes of pregnancy and continues through childbirth and beyond. This transition is filled with a range of emotions, both positive and negative. Mothers experience changes to their identity and role, which are shaped by their values, cultural norms, and societal influences. There is a perception that after a baby is born, a new mother will instinctively know what to do. This is seemingly supported by biology. Sex steroid hormones, progesterone and estrogen, as well as surges in oxytocin, change the structure of the new mother's brain in areas that are associated with empathy, emotion regulation, emotional sensitivity, and attachment. These changes help mothers feel more attuned to their baby's cues and respond to their needs, in turn promoting a stronger parent-child bond (Kim et al., 2016).



Figure 9.4.1. Skin-to-skin contact helps both mothers and newborns bond. Image is licensed CC BY-SA 2.0.

However, for many first-time mothers, learning to change diapers, be comfortable with feeding, soothing a crying baby, all while feeling exhausted and overcome with the hormonal changes postpartum, can take weeks or months to adjust. Many mothers experience the **“baby blues,”** a transient emotional state characterized by mood swings, weepiness, irritability, and feelings of overwhelm. Baby blues typically begin a few days after delivery and subside within two weeks. This condition is believed to result from the rapid hormonal fluctuations following childbirth, coupled with the demands of caring for a newborn and sleep disruption.

In contrast, **postpartum depression** (PPD) is a more severe and persistent mental health condition that affects up to 15% of mothers (American College of Obstetricians and Gynecologists [ACOG], 2021). Symptoms of PPD include prolonged sadness, loss of interest in activities, feelings of worthlessness or guilt, difficulty bonding with the baby, and even thoughts of self-harm or harming the baby. Unlike baby blues, PPD requires medical attention, and treatment may include therapy, medication, or a combination of both.

Fatherhood

The transition into fatherhood begins well before the baby is born. Fathers play a critical role in prenatal and postnatal experiences, contributing to the well-being of both the mother and child. Fathers actively prepare for the birth of their child in various ways, including attending prenatal appointments, childbirth education classes, and supporting their partner's physical and emotional needs. Many fathers engage in reading books, consulting healthcare providers, and seeking advice from experienced parents to

build confidence and knowledge about the birthing process and caregiving (de Montigny & Lacharité, 2016). This preparation often enhances the father's sense of involvement and helps lay the foundation for a strong co-parenting relationship.



Figure 9.4.2. Fathers also undergo significant emotional and cognitive changes after the birth of a child. Image by Ian D. Keating is licensed CC BY 2.0.

While much of the attention during the postpartum period focuses on the mother and baby, fathers also undergo significant changes. Many fathers experience a sense of joy and fulfillment as they bond with their baby. Fathers may choose to engage in skin-to-skin contact, bottle feeding, diaper changes, and playtime routines to help establish the father-child connection. Research shows that oxytocin, a hormone associated with bonding, increases in fathers during the early months of their child's life, reinforcing emotional attachment (Feldman et al., 2010). However, some fathers may also encounter stress or feelings of inadequacy, particularly if they struggle to balance work and family life or adjust to new routines.

Some fathers experience a phenomenon known as **paternal postnatal depression (PPND)**, a condition characterized by sadness, irritability, and withdrawal. PPND is often linked to stress, changes in routine, and difficulty adjusting to the demands of fatherhood. Like maternal postpartum depression, PPND is treatable with therapy, support groups, and, in some cases, medication.

Becoming a Family

The transition to parenthood often brings significant challenges, as couples navigate shifting roles and responsibilities while adjusting to their new identities as a family. Some of these challenges include, but are not limited (Levine & Munsch, 2024):

- fatigue and exhaustion
- depression, anxiety, and/or self-doubt
- concerns over changes to physical appearance for women,
- family finances,
- increase in household responsibilities,
- changed relationships between parents and extended family,
- sources of gratification.



Figure 9.4.3. New parents celebrate the arrival of their baby in the Maternal/Newborn Ward at Naval Hospital Yokosuka. Image is in the public domain.

These challenges are deeply influenced by cultural norms, which shape expectations about parenting roles and family dynamics. In many Western cultures, the transition is often characterized by the need to balance work and family life, with growing societal emphasis on shared parenting. Both mothers and fathers may struggle with the pressures of meeting these expectations while

managing sleep deprivation, reduced personal time, and the emotional and physical demands of caring for a newborn (Dermott & Miller, 2015).

In collectivist cultures, the transition to parenthood is often supported by extended family networks that provide both practical and emotional assistance. However, this communal approach can also bring challenges, such as navigating differing generational views on parenting practices or balancing the expectations of elders with the couple's personal preferences. Fathers in these cultures may feel pressure to fulfill traditional roles as providers, while mothers may encounter societal expectations to prioritize caregiving and domestic responsibilities (Kim & Hong, 2007). Despite these differences, the transition to becoming a family universally requires couples to renegotiate their relationship, adapt to new demands, and find a balance between cultural expectations and their own values.

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CHAPTER OVERVIEW

10: Creativity and the Process

10.1: What is Creative Development?
10.2: Understanding the Process
10.3: Supporting Creativity through Interactions
10.4: Environments that Inspire and Support Creativity
10.5: Promoting Creativity with Infants and Toddlers
10.6: Promoting Creativity with Preschoolers
10.7: Promoting Creativity in Middle Childhood

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10.1: What is Creative Development?

Learning Objectives

1. Define creative development in the context of early childhood education.
2. Explain the significance of creativity in fostering children's development across all domains.
3. Identify key factors that influence creative development in young children.

Creativity refers to the *process through which individuals cultivate and express their creativity, imagination, and originality* (Isbell & Yoshizawa, 2016). It encompasses the ability to generate novel ideas, think outside the box, and engage in artistic, innovative, or imaginative activities.

The most common outlets of creative development in early childhood are related to:

- the visual arts (painting, 3-D sculptures with clay or play-dough, drawing, collage, etc.),
- music and movement, and
- dramatic arts (storytelling, use of props, etc.).

Creativity Across All Domains of Learning

However, creative development is not limited to artistic pursuits but extends to problem-solving, critical thinking, and the exploration of new possibilities in various domains. Encouraging children to engage in creative activities stimulates their cognitive, physical, emotional, and social development, fostering qualities such as curiosity, flexibility, resilience, and self-expression.

Creative Meets Cognitive Development

Expression and Communication: Creative activities such as drawing, painting, storytelling, and role-playing provide children with avenues to express themselves and communicate their thoughts, feelings, and ideas. Through these activities, children develop language skills, vocabulary, and the ability to articulate their experiences, enhancing their communication abilities.

Critical Thinking and Problem-Solving: Engaging in creative tasks challenges children to think critically, explore possibilities, and find solutions to problems. Whether it's building with blocks or inventing stories, creative activities stimulate cognitive processes such as analysis, synthesis, and evaluation, fostering problem-solving skills and strategic thinking.



Figure **10.1.1**. A group of older preschoolers engaging in cross-play using props from the home living center in the block area.

Image by Heather Carter is licensed CC BY-SA 4.0.

Imagination and Innovation: Creative development encourages children to tap into their imagination, think imaginatively, and envision new ideas and possibilities. Imaginative play, fantasy stories, and pretend scenarios allow children to explore different perspectives, create imaginary worlds, and develop innovative thinking skills that are essential for adapting to new situations and generating novel ideas.

Creative Meets Social & Emotional Development

Emotional Regulation and Self-Expression: Creative activities offer children outlets for emotional expression, enabling them to understand and manage their emotions effectively. Artistic endeavors, music, dance, and drama allow children to explore their feelings, express themselves authentically, and develop emotional intelligence, resilience, and self-awareness.

Collaboration and Social Skills: Engaging in collaborative creative projects promotes teamwork, cooperation, and social interaction among children. Working together on art projects, storytelling, or dramatic play fosters communication, empathy, negotiation, and conflict-resolution skills, enhancing their ability to collaborate effectively with others.



Figure **10.1.2**. Three preschool children are playing at a hair salon in the home living area. Image by Heather Carter is licensed CC-BY-SA 4.0.

Creative Meets Physical Development

Fine Motor Skills: Many creative activities, such as drawing, coloring, painting, cutting, and crafting, require precise hand-eye coordination and manipulation of small objects. These activities help children develop and refine their fine motor skills, including dexterity, grip strength, and hand control. Strengthening fine motor skills is essential for tasks such as writing, tying shoelaces, and using utensils effectively.



Figure **10.1.3**. A preschool girl is setting a nail in place on a piece of wood at the woodworking area. Image by Heather Carter is licensed CC BY-SA 4.0.

Gross Motor Skills: While some creative activities focus on fine motor skills, others involve gross motor movements such as dancing, playing musical instruments, building with blocks, or engaging in outdoor exploration and physical play. These activities

promote the development of gross motor skills like balance, coordination, agility, and spatial awareness. Gross motor skills are essential for activities such as running, jumping, climbing, and participating in sports.

Sensory Exploration: Creative activities often involve sensory experiences such as touching different textures, experimenting with colors and shapes, listening to music or sounds, and exploring various materials. Sensory exploration not only stimulates cognitive development but also enhances sensory integration, proprioception, and body awareness. This sensory input contributes to overall physical development and sensory-motor coordination.

Body Movement and Expression: Creative outlets such as dance, drama, and the expressive arts encourage children to use their bodies as a means of expression and communication. Engaging in rhythmic movements, gestures, poses, and facial expressions not only fosters creativity but also promotes physical expression, body awareness, posture, balance, and control. Dance, in particular, supports cardiovascular health, flexibility, strength, and endurance.



Figure 10.1.4. Two toddler girls singing into "microphones" made of Zoobs manipulatives. Image by Heather Carter is licensed CC BY-NC-ND.

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10.2: Understanding the Process

Learning Objectives

1. Explain the process of creative development in young children.
2. Describe how early childhood professionals can support and nurture the creative process.

Creativity Anywhere, Anytime

Creativity can happen anywhere, anytime. Creativity is often a part of play in all areas of the classroom. Here are several examples:

- blocks and building structures,
- constructing with open-ended manipulatives like Zoobs, Magnatiles, Squiz, etc.,
- science and experimentation, such as arranging magnetic tubes to create a ramp system,
- tinkering with technology to develop "improvements", or
- using loose parts to tell a story.

Why the Creative Process is Important...

"Creativity becomes more visible when adults try to be more attentive to the cognitive processes of children than to the results they achieve in various fields of doing and understanding" (Edwards et.al, 1998, p.77). Creativity involves complex ways of thinking, yielding diverse pathways that sometimes lead to similar and sometimes different results. This process can be difficult to study or measure (Isbell & Yoshizawa, 2016).



Figure 10.2.1. "Creativity requires the courage to let go of certainties is a quote by Erich Fromin. Image is licensed by Denise Krebs CC-BY 2.0

Yet, the process is the underlying foundation for much of children's and humans' development and learning. For example, even the simple task of kicking a ball in the direction you want it to go requires analyzing body movements and types of contact with the ball, as well as assessing the amount of power applied to the ball. As one practices, one becomes more aware of and in tune with one's body, allowing for the refinement of how one moves in relation to the ball's resulting position after the kick is made. Repeating the process over and over, and making small adjustments, helps one learn how to kick a ball in the direction you want it to go.

Not every process lends itself to an enduring product (Isbell & Yoshizawa, 2016), sometimes because of the nature of the project, as is the case with the art of kicking a ball. Sometimes it is because the child dismantles their efforts because he/she is finished playing. At other times, it's because the product naturally evolves during the process and loses its effectiveness.

> *What children think and what they do as they engage in an activity- and how their thinking develops and matures as a result- are the most important aspects of the experience. Some creative activities, however, do result in a product. The distinction is that children select the materials, tools, and techniques to produce their own unique*

> *results. The final product is not predetermined by the teacher or copied from another's work, but is instead one of a kind... (Isbell & Yoshizawa, 2016, p. 21)*

The Value of Open-Ended Creative Endeavors

How do open-ended art experiences offer so many opportunities for learning? Consider the difference between open-ended and closed-ended questions. Close-ended questions tend to result in one-word answers and limit children's thinking, such as "Did you have a good day?". However, open-ended questions and prompts challenge children to use creative and critical thinking skills (NAEYC, 2015). For example, "How was your day?".



Figure 10.2.2. Art gallery that includes 2-D and 3-D pieces. Image by Heather Carter is licensed CC-BY-SA 4.0.

This same concept applies to closed vs. open-ended art. Closed-ended projects, such as coloring in a coloring book or gluing pre-cut pieces to make a craft, may support fine motor skills, but open-ended art builds these skills *while* challenging children's creativity and critical thinking.

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10.3: Supporting Creativity through Interactions

Learning Objectives

1. Explain the importance of teacher-child interactions in fostering creativity.
2. Identify strategies for early childhood professionals to support creativity through interactions.

Supporting Creativity Through Interactions

Daily interactions provide the foundation for creativity in young children. Children who have developed relationships with warm, caring adults are more likely to feel safe when exploring new situations and environments. The way adults interact with young children can either encourage or stifle their creative exploration. Supporting creativity in daily interactions involves being responsive, providing opportunities for exploration, and encouraging curiosity.

Responsive Interactions

Responsive interactions are key to nurturing creativity.

1. **Take cues from the child**. When adults respond to a child's cues, they validate the child's feelings and ideas, which fosters confidence and encourages further exploration. For example, suppose a toddler points to a bird outside. In that case, the professional might respond by discussing the bird, imitating its sounds, or even encouraging the child to draw or imitate the bird. These interactions help children feel that their ideas are valued and worth exploring.
2. **Open-ended questions.** Simple activities such as asking open-ended questions, encouraging imaginative play, and providing positive reinforcement can significantly impact a child's creative development. For instance, instead of asking, "What color is the sky?" you might ask, "What else could the sky look like today?" This type of questioning encourages children to think beyond the obvious and explore possibilities.
3. **Positive reinforcement and praise.** Positive reinforcement, such as praising a child's *effort rather than the outcome*, fosters a growth mindset that is crucial for creative thinking (Dweck, 2006). For example, saying, "I love how you mixed those colors together," rather than "Your painting is beautiful," emphasizes the process of creation rather than the final product, encouraging further exploration and experimentation.

Encouraging Exploration

Providing opportunities for exploration is another way to support creativity. This can be as simple as allowing young children to explore different textures, sounds, and materials. For example, a caregiver might provide a variety of safe household items, such as wooden spoons, fabric, and empty containers, for infants and toddlers to explore (Council for Professional Recognition, 2023). This not only supports sensory development but also encourages the child to think creatively about how to use these objects in different ways.

In the photo below, an exploration area has been set up with various sensory bottles, a scarf pull, touch lights (batteries are stored behind a screwed-in compartment), and a board featuring many flooring samples to touch and/or sit, walk, or crawl on in an infant classroom. (The photo was taken during a conference on a Saturday morning, which is why a coffee cup is sitting on top of the shelf. No children were present. The exploration area is set up in a safe, open place for infants to move freely and have uninterrupted time to explore. Depending on the age and developmental needs of the child(ren), these spaces will look very different.



Figure **10.3.1**. Infant classroom's exploration area with sensory jars, push-button lights, mixed flooring board, and other materials. Image by Heather Carter is licensed CC BY-SA 4.0.

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10.4: Environments that Inspire and Support Creativity

Learning Objectives

1. Describe how the physical environment can influence and support creativity in young children.
2. Identify key elements of an environment that foster creativity.

In essence, the early childhood environment is more than just a physical space—it is a dynamic ecosystem that shapes and nurtures young minds. While a professional's vision and design of the environment affect children's responses and prompt engagement, it is the child's use of the environment that determines how learning and development occur in meaningful ways.

The early childhood environment serves as a canvas for fostering creativity and imagination. Children are naturally curious and imaginative beings, and their surroundings have a significant influence on the expression of these qualities. A well-designed environment encourages exploration, experimentation, and problem-solving —fundamental aspects of creative development. From open-ended materials to inviting spaces that stimulate the senses, every element of the environment contributes to sparking and nurturing children's creativity.



Figure **10.4.1**. A toddler classroom enriched with natural light and space to explore sound. Image by Heather Carter is licensed CC BY-SA 4.0.

Moreover, the early childhood environment is a powerful catalyst for learning. Young children learn best through hands-on experiences and meaningful interactions with their surroundings. An environment that is rich in age-appropriate, open-ended materials provides ample opportunities for children to engage actively in the learning process. By immersing themselves in a stimulating environment, children can absorb new concepts, develop essential skills, and make meaningful connections that lay the groundwork for future academic success.

Ultimately, the early childhood environment plays a pivotal role in fostering self-expression. For young children, finding ways to communicate thoughts, feelings, and experiences is essential for social and emotional development. An environment that values and supports self-expression empowers children to express themselves authentically through various mediums, such as art, music, movement, and dramatic play, by providing avenues for self-expression, the early childhood environment fosters confidence, self-awareness, and a sense of belonging, which are essential for overall well-being and positive social interactions.

Planning Effective Environments

While environments were explored in more depth earlier in the text, there are a few general considerations that align well with understanding how to support children's creativity and the learning process. Think of spaces that make you feel calm, focused, and

welcomed. What do they look like? What elements do they include? Now, consider the diverse people, families, and communities that comprise an early childhood program. How do we combine the two?

By reflecting the diversity within the local community's culture, language, and geographical features, as well as children's interests, we can incorporate more commonly identified elements such as lighting, colors, textures, organization, and the presentation of spaces. This approach enables us to create an environment that communicates a sense of belonging.

Warm and Welcoming

Natural lighting is important for learning and behavior because it helps regulate our mood (Boubekri et al., 2014) and has been proposed as the single most important element in the learning environment (Fielding, 2017). However, using natural light isn't always conducive to spaces that have been retrofitted or not designed with lighting in mind. Using sturdy table and floor lamps can help accentuate specific areas of the room or materials, in addition to supplementing natural light (Isbell & Yoshizawa, 2016).



Figure 10.4.2. A light table is propped up vertically to illuminate objects in front of it. Black fabric is utilized behind and below the light table to help direct light. Image by Heather Carter is licensed CC BY-SA 4.0.

Color, texture, and sound also play a role in establishing a sense of calm and warmth in the environment. Bright primary colors were once believed to engage children's senses, promoting activity and learning, and eventually became a standard across many early childhood programs. However, partly influenced by the Reggio Emilia school environment and partly by research on how color affects our productivity, mood, and creativity, early childhood programs are now shifting towards more neutral and earthy tones, allowing the environment to serve as a backdrop for creativity and learning.

Natural elements add texture and visual appeal. Rugs, non-toxic plants, pillows with washable covers, draped fabrics, and other materials can help define spaces when used thoughtfully. Sounds can also support or distract children's creativity. Arrangements of spaces within the environment, in keeping noisy areas away from quieter ones, and how music is used throughout the day are important considerations when designing a space that is warm and inviting.



Figure **10.4.3**. An infant room with mirrors, boxes, and other soft elements for exploring. Image by Heather Carter is licensed CC BY-SA 4.0.

Provide a Sense of Belonging

Most early childhood programs include children from diverse ethnic backgrounds, cultures, lifestyles, abilities, languages, religions, and family structures. When these differences are reflected within the environment, it communicates a sense of belonging. It expands the possibilities for creative work shaped by the characteristics and needs of the individual children (Isbell & Yoshiwaza, 2016).

Some ways to reflect this diversity are through:

- Display photos that represent the children, learning within the program, families, and/or places within the local community
- Display children's art, work, or familial artifacts
- Provide a variety of books, materials, and activities that are relevant to the current diversity within the group
- Bring in customs or traditions celebrated by children/families within the classroom

Consider Children's Work and Learning

In the realm of early childhood education, the environment plays a pivotal role in shaping young minds and fostering holistic development. Whether in large groups, small groups, pairs, or working individually, the design and arrangement of the learning environment have a significant impact on children's creativity and learning potential. One general consideration is the understanding that children need to do and use too much before they can learn how to use just the right amount. This extends to using a lot of paper, glue, paint, and other materials. Always ensure you have a sufficient supply of materials on hand. If resources and budget are an issue, try using manila and butcher paper in lieu of construction paper, and consider using recyclables. Additionally, dilute glue or watercolor with a bit of water.



Figure 10.4.4. Dilute glue with approximately 25% water in glue pots using paintbrushes, as a more cost-effective option for using glue in early childhood programs. Image by Heather Carter is licensed CC BY-SA 4.0.

Large Groups

In large group settings, such as classrooms or communal spaces, the environment should be structured to accommodate diverse activities while encouraging social interaction and collaboration. Interactive learning centers and ample space for movement allow children to engage with peers, share ideas, and participate in group activities. To spark curiosity and promote active participation, consider incorporating:

- stimulating visuals,
- age-appropriate materials, and
- multisensory experiences.



Figure 10.4.5. The reading area in an older toddler classroom offers ample space for large groups, featuring various surfaces and soft elements for sitting, lying, and relaxing while reading. Image by Heather Carter is licensed CC BY-SA 4.0.

Small Groups

Conversely, in small group settings of two to six children, the environment can be tailored to facilitate focused exploration and meaningful interactions. Creating inviting spaces for small group discussion, cooperative projects, and guided activities could include:

- cozy corners,
- rotated interest centers,

- cross-area play in learning centers. **Cross-area play** is unscripted play that provides children the freedom to utilize materials from all areas of the classroom (Minahan et.al, 2021).

By providing opportunities for children to work closely with peers, share perspectives, and problem-solve collaboratively, the environment cultivates creativity through a shared process.



Figure 10.4.6. These children chose the block area so that a road could be built to get to the picnic site. Cross-play with props from the home living area was encouraged by the teachers so that the group would fully commit to the shared vision. Image by Heather Carter is licensed CC BY-SA 4.0.

Partner and Individual Work

Similarly, in partner and individual learning settings, the environment should be conducive to independent exploration, self-directed inquiry, and personalized learning experiences. Some of the ways to incorporate might include:

- quiet or alone areas (sometimes called safe spaces),
- designated workstations, such as a listening area,
- and comfortable seating arrangements that consider the type of work being offered as a rotated daily activity.



Figure 10.4.7. Exploring primary color tinted vinegar with baking soda on mirrors is set up as a rotated daily activity for children to explore individually or in pairs. Image by Heather Carter is licensed CC BY-SA 4.0.

Providing children with the autonomy to pursue their interests, engage in reflective practices, and undertake projects at their own pace empowers them to take ownership of their learning and express themselves creatively. By thoughtfully designing spaces that inspire curiosity, encourage exploration, and support diverse learning styles, professionals can create environments where every child thrives and discovers their full potential.

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10.5: Promoting Creativity with Infants and Toddlers

Learning Objectives

1. Explain the importance of supporting creative development in infants and toddlers.
2. Identify strategies for promoting creativity in infants and toddlers.

Creativity is an essential aspect of development that begins in the earliest stages of life. For infants and toddlers, creativity is not just about producing art; it is about exploration, problem-solving, discovery, and expressing themselves in various forms. This section will explore how professionals can support creativity with infants and toddlers through daily interactions, visual arts, music and movement, dramatic arts, and other learning areas.

Creativity in the Visual Arts

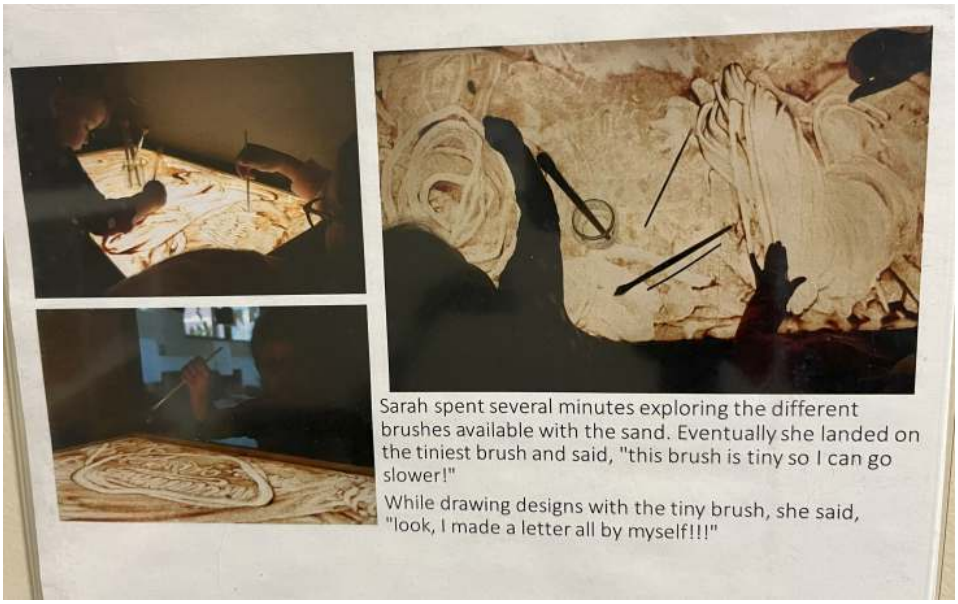


Figure **10.5.1**. An older infant is using a paintbrush in sand that was spread in a layer on top of a sensory table. Image by Heather Carter is licensed CC BY-NC-ND.

Introducing infants and toddlers to a variety of materials is crucial for fostering creativity in the visual arts (Mayesky, 2014). Materials should focus on safety with non-toxic items that engage the five senses. Some examples include:

- non-toxic and washable paints,
- crayons,
- clay,
- edible play-dough,
- natural materials like leaves or sand,
- cardboard boxes,
- tape,
- tearing tissue paper,
- jumbo chalk, etc.

For example, a toddler might be given a piece of paper and a set of chunky crayons. Rather than instructing the child on what to draw, the professional can encourage the child to explore the colors and textures, perhaps by making marks on the paper or even on different surfaces. This free exploration enables the child to experiment with cause and effect, a foundational aspect of creative thinking.

Creativity in Music and Movement

Music and movement are natural forms of expression for infants and toddlers. Supporting creativity in movement involves allowing children to move freely and explore their bodies in space. The music and movement area is also a great way to introduce diversity within cultures, providing them a way to learn more about themselves and others. For example, during music time, a caregiver might play a variety of music styles and encourage the toddler to move in any way they wish. This might involve jumping, spinning, or simply swaying to the rhythm.

Exploring different sounds is another way to foster creativity in young children. Early childhood professionals can provide instruments like drums, shakers, or even pots and pans for children to experiment with. For example, a toddler might discover that tapping a pot with a wooden spoon produces a different sound than tapping it with their hand. Instruments from other cultures, like the didgeridoo, rain sticks, steel drums, maracas, castanets, etc. all make different sounds that can be explored. Incorporating music and sounds into daily routines can make everyday activities more enjoyable and creative. For instance, a caregiver might sing a song while helping a toddler get dressed or create a rhythm game during clean-up time.

Picking Songs and Fingerplays

Try to pick and introduce songs and fingerplays to infants, toddlers, (and preschoolers) that:

- can easily be remembered,
- has repetition or a predictable pattern,
- avoids high notes or difficult chord progressions, and
- use language (lyrics) that is easy to say.

Creativity in Dramatic Arts

Encouraging role-playing activities can help toddlers explore different scenarios and roles. For example, a professional might provide a set of simple costumes or props, such as hats, scarves, vests, wallets, or stuffed animals, and invite the child to engage in pretend play. A toddler might pretend to be a doctor, using a toy stethoscope to “check” a stuffed animal’s heartbeat. This type of play enables children to experiment with various roles and scenarios, thereby fostering creativity and social-emotional development.

Storytelling is another way to support creativity in the dramatic arts. Professionals can work with the child to create stories, allowing them to contribute ideas and direct the narrative. For example, a caregiver might start a story about a bear that goes on an adventure and then ask the child, “What happens next?” This not only encourages the child to think creatively but also supports language development and narrative skills.

Creativity in Other Learning Areas

Creativity is not limited to the arts; it can be nurtured in various other learning areas, including science, mathematics, blocks, and manipulatives. Science provides endless opportunities for creative exploration. For example, a caregiver might set up a simple experiment, such as mixing baking soda and vinegar, and ask the toddler to predict what will happen. This encourages the child to think critically and creatively about cause and effect. Additionally, exploring nature—such as examining leaves, rocks, or insects—can spark curiosity and creative thinking.

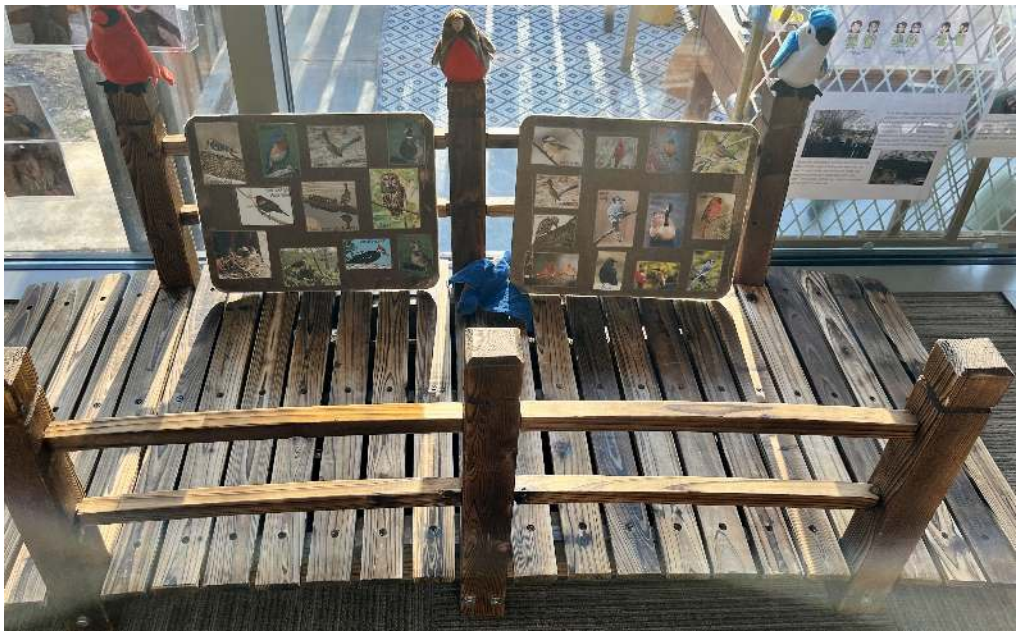


Figure **10.5.2**. Boards with pictures of various birds attached are at infants' eye level by the classroom window so that they may bird watch on nice days. Image by Heather Carter is licensed CC BY-SA 4.0.

Mathematics is another area where creativity can be nurtured. For instance, caregivers can introduce counting games that involve sorting objects by size, color, or shape. When toddlers are given a set of blocks, they might begin by simply stacking them, enjoying the challenge of balancing one on top of the other. Over time, as they become more familiar with the materials, they might start to build more complex structures, such as towers, bridges, or enclosures. This process involves trial and error, as children experiment with how different shapes and sizes of blocks fit together. Encouraging children to experiment with different arrangements and combinations of blocks and manipulatives helps them to express their creativity through design and organization.

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10.6: Promoting Creativity with Preschoolers

Learning Objectives

1. Describe how creativity can be supported in preschoolers.
2. Identify strategies for fostering creativity in preschoolers.

Preschool children often have a natural fascination with the process of creating visual art. Making marks, squishing clay, and using a brush to apply color are activities that most young children find appealing. In groups where children speak multiple languages and may not share common vocabulary, visual art can create connections and serve as a means of communication. Art can become a way for people to connect across cultures to their common humanity; an appreciation for it may begin in preschool. Inviting families into the environment to share works of art from their homes is an opportunity to build a bridge to the home (Paris et al., 2021).

Young children are naturally creative. The visual art framework is designed to encourage creativity; open-ended projects emphasize the process of working with visual materials. In other words, the curriculum is not focused on encouraging a child to produce a specific painting, but rather to practice using a brush on paper without a predetermined outcome (Paris et al., 2021).



Figure **10.6.1**. This child is painting at the easel. Image by The California Preschool Curriculum Framework, Volume 2 by the California Department of Education is used with permission**.**

Visual Arts

One effective way to support creativity in the visual arts is to provide a variety of materials without specific instructions. This approach encourages children to use their imagination and come up with their own ideas. For example, offering items like clay, buttons, fabric scraps, and natural materials like leaves and twigs can inspire children to create unique art pieces. Activities such as drawing, painting, and sculpting enable children to explore various materials, textures, and colors, thereby developing their fine motor skills and spatial awareness.

Professionals can support children's development of the visual arts foundations with the following (Paris et. al, 2019):

- Encourage engagement with art at all levels.
- Support exploration and discovery.
- Give children the time and space they need to explore their creativity.
- Provide a comfortable environment that allows children to practice art.
- Provide opportunities for children to reflect on their own work.
- Respect individual developmental, cultural, and linguistic differences, and encourage children to do the same.
- Provide children simply with a means and place to make marks (e.g., a crayon and paper), and they will begin with the same basic images.
- Encourage communication around shape and form to aid children's drawing skills.
- Help children acquire painting skills through practice with the tools.
- Stimulate children's interest in color and the application of paint through other forms of painting.
- Create opportunities for children to work with dough, clay, or wet sand.

- Provide only the malleable material, without tools, during children's initial explorations of sculpting so that children have a chance to explore through touch.
- Communicate with a group of linguistically and culturally diverse children through sculpture techniques by using nonverbal methods.
- Introduce tools after observing that children have had numerous hands-on opportunities to explore clay and dough sculpture.

Additionally, integrating discussions about famous artworks or artists into the curriculum can inspire children. Asking questions like, "How do you think the artist created this?" or "What do you think this painting is about?" encourages children to think critically and creatively about art (Edwards et al., 2011).



Figure **10.6.2**. Art activity set up for children to paint the real-life sunflowers similar to how Van Gogh painted his. Image by Heather Carter is licensed CC BY-NC-ND.

Music and Movement

To support creativity in music and movement, educators can create an environment that encourages children to experiment with sounds and movements freely. For instance, providing a variety of instruments and encouraging children to create their own songs or rhythms fosters creative expression. Movement activities, such as improvisational dance, where children are encouraged to move in response to different types of music, help develop both creative thinking and physical coordination.

A practical example is setting up a "music and movement corner" in the classroom, complete with instruments such as drums, tambourines, and xylophones, as well as scarves or ribbons for dancing. Teachers can play different genres of music and invite children to express what they hear through movement, further supporting their creative development (Glover, 2000).



Figure **10.6.3**. The music and movement learning area is set up in a younger preschool classroom. Image by Heather Carter and is licensed CC BY-NC-ND.

The following is an excerpt from Paris et.al (2021) on additional ways to support creativity through music and movement:

- Find ways to expose children to music being conducted and performed.
- Provide music areas where children can experience instruments or participate in musical activities as individuals or in small groups.
- Set up a “Science of Sound” area where children can explore and experiment with building sounds.
- Provide a conductor’s listening and play area.
- Make instruments with the children.
- Incorporate chant games and songs related to sound production.
- Include a variety of songs that are related to a particular topic area
- Use songs that have movements or gestures that accompany the words.
- Provide children with an opportunity to conduct the group by singing or playing instruments.
- Dramatize poetry and nursery rhymes as a fun way to explore and develop vocal inflection and pitch capabilities in the young singer.
- Invite young children to move to instrumental program music or music that tells a story.

Drama

The following is an excerpt from Paris et.al (2021) on ways to support the dramatic arts in preschool:

- Observe dramatic play and role-playing.
- Step in or model when needed.
- Provide adaptations to support the participation of children with disabilities or other special needs. This may include pre-teaching, using pictures, sign language, and other multisensory enrichment techniques, as well as modified equipment and props.
- Use a drama-based vocabulary. For example, blocking, actors, stage, scenery, voice, props, and so on.
- Encourage children to use drama-based vocabulary
- Encourage and model the expression of interests and preferences.
- Encourage and allow initiative.
- Model and note appropriate ways of using drama materials.
- Move in and out of the role as appropriate (decide when to participate and when to facilitate).
- Use costumes, props, and scenery to inspire dramatic play and drama.

- Facilitate children's engagement in drama by first discussing expectations.
- Scaffold and encourage children during and after participating in drama to build their understanding and use of plot.

Creativity Across the Program

Science and Math: Encouraging children to ask questions, make predictions, and experiment with different outcomes supports creativity in science and math. For example, during a simple experiment with water and various objects, asking, "What do you think will happen if we drop this in the water?" encourages children to think creatively and explore scientific concepts. Similarly, in math, providing open-ended problems, such as "How many different ways can we build a tower with these blocks?" promotes creative problem-solving and critical thinking.

Cooking: Cooking activities offer numerous opportunities for creativity. Children can experiment with different ingredients, flavors, and textures, which not only supports sensory development but also encourages creative thinking. For instance, asking children to design their own pizza or sandwich allows them to explore combinations of ingredients and develop their culinary creativity.

Blocks and Manipulatives: Building with blocks and using manipulatives, such as puzzles or pattern blocks, supports spatial awareness and problem-solving skills while also fostering creativity. Encouraging children to create their own structures, patterns, or designs without specific instructions promotes imaginative thinking. For example, setting up a "building challenge" where children are asked to create something that can hold a certain amount of weight encourages them to think creatively and explore engineering concepts.

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10.7: Promoting Creativity in Middle Childhood

Children in the school-age years (approximately 6 to 12 years old) are naturally curious and increasingly capable of expressing themselves in more sophisticated ways. As professionals, it is important to create environments that nurture and expand their creative thinking.

Provide Time, Space, and Materials

Creativity flourishes when children have unhurried time and flexible spaces to engage in imaginative activities. While school-age children often have structured schedules, it is essential to preserve opportunities for open-ended exploration.

- **Unstructured time** allows children to experiment, build, draw, write, or pretend without a prescribed goal.
- **Flexible spaces**—such as a classroom creativity corner, a home craft area, or an outdoor play zone—invite children to explore ideas at their own pace.
- Avoid overscheduling. Allow children to experience “boredom” as a gateway to generating their own ideas and activities. Additionally, 4-H clubs offer a great opportunity to explore interests and access a variety of materials.

Children need access to a wide range of materials to create, experiment, and express ideas in different forms. These do not have to be expensive or specialized.

- Include **open-ended materials** such as blocks, clay, markers, cardboard, natural materials, musical instruments, and costume pieces.
- Encourage **re-purposing** and combining materials in new ways. For example, a paper towel roll can be transformed into a telescope, a megaphone, or a puppet's part.
- Support children’s ideas by offering supplies that match their interests (e.g., a child interested in fashion design might use fabric scraps and sewing tools).

What Does This Look Like in the Classroom or At Home?

In a classroom, a professional might set up a “makerspace” with rotating materials and leave time each week for invention projects. At home, a caregiver might keep a basket of craft supplies in reach and invite the child to create something new after school. In both cases, the key is not the outcome, but the encouragement to try, explore, and imagine.



Figure 10.7.1. Makerspaces are a popular option to encourage creativity in middle childhood. Image by Stadtbibliothek Neuss is licensed CC BY-SA 4.0.

Supporting through Interactions

The same principles of supporting children through interactions apply to those in middle childhood: use specific and positive reinforcement, avoid comparing children's work to others, focus on the process, and normalize mistakes by treating them as learning opportunities. Statements like, "That didn't work-- what else could you try?" keep children engaged and motivated.

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CHAPTER OVERVIEW

11: Physical Development in Infancy and Toddlerhood

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 notable physical changes that occur during this period.[1]

11.1: Brain Development
- 11.1.1: Developmental Processes
- 11.1.2: Disorders Related to Brain Development

11.2: Sensory Capacities

11.3: Body Growth and Motor Development
- 11.3.1: Reflexes
- 11.3.2: Gross Motor Skills
- 11.3.3: Fine Motor Skills
- 11.3.4: Variability in Motor Development

11.4: Safety

11.5: Health
- 11.5.1: Vaccinations
- 11.5.2: Sleep

11.6: Nutrition
- 11.6.1: Breastfeeding
- 11.6.2: Starting Solids
- 11.6.3: Malnutrition

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SECTION OVERVIEW

11.1: Brain Development

Learning Objectives

1. Describe the timeline of brain growth from prenatal development through early childhood.
2. Identify the primary structures of the brain and their functions in early learning and development.
3. Distinguish between the roles of the left and right hemispheres and the function of the corpus callosum.

Introduction

Brain development begins long before birth, with neural structures forming as early as the first trimester. By the third trimester, the brain undergoes significant growth, establishing the foundation for sensory processing, movement, and early learning (Kolb & Gibb, 2011). At birth, the brain is about 25 percent of its adult weight. By age 2, it is at 75 percent of its adult weight, at 95 percent by age 6, and at 100 percent by age 7.

Neural connections, or synapses, form at an extraordinary rate, influenced by both genetic programming and early experiences (Center on the Developing Child at Harvard University, 2020). These connections create the brain's architecture, which is refined through synaptic pruning—a process that strengthens frequently used pathways while eliminating those that are less active (Nelson, 2019).

The relationship between the body and the brain is deeply interconnected. As infants develop motor control, sensory awareness, and coordination, these physical developments significantly shape their cognitive and emotional growth (Shonkoff & Phillips, 2000). Likewise, the experiences young children have—such as caregiver interactions, sensory stimulation, and environmental exposure—directly influence both brain and body development. Positive experiences, such as responsive caregiving and rich learning environments, support healthy growth, while adverse experiences, such as chronic stress, can disrupt brain-body connections and impact long-term well-being (National Scientific Council on the Developing Child, 2014).

Understanding this dynamic interplay between brain and body is essential for fostering optimal development in early childhood. This section explores the foundational aspects of brain growth, the impact of early experiences, and strategies for promoting healthy cognitive and physical development in infants and toddlers.

Structures of the Brain

The human brain is a complex organ responsible for processing information, controlling movement, and regulating emotions. Understanding the basic structures of infants and toddlers helps explain how they learn, develop, and interact with the world around them.

The brain is divided into two halves, known as the left and right hemispheres. Each hemisphere specializes in different functions, a process known as **lateralization** (Kolb & Gibb, 2011). While both hemispheres communicate and work together, they tend to have distinct roles:

Left Hemisphere: Generally associated with language processing, logic, and analytical thinking. It becomes especially important as children begin developing speech and comprehension.

Right Hemisphere: Primarily involved in spatial abilities, creativity, and processing emotions. This hemisphere plays a crucial role in recognizing facial expressions and interpreting social cues.

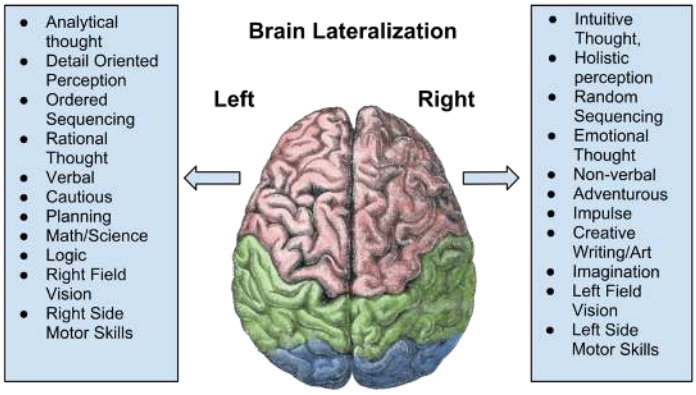


Figure 11.1.1. Brain Lateralization. Image by Chickensaresocute is licensed CC BY-SA 2.5

The **corpus callosum**, a thick bundle of nerve fibers, connects the two hemispheres, allowing information to pass between them. This structure supports coordination between different types of thinking and movement, helping infants integrate sensory experiences and motor skills (Gazzaniga et al., 2018).

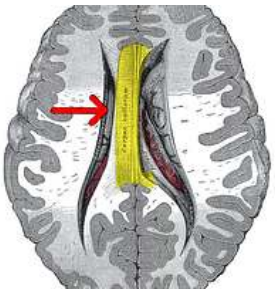


Figure 11.1.2. Emphasizing the Corpus Callosum. Image by Gray's Anatomy. Image is in the public domain.

Beyond the hemispheres and corpus callosum, several other brain regions play important roles in early development.

Table 11.1.1. Brain Structure and Primary Functions.

Brain Structure	Function(s)
Cerebral Cortex	Higher-level thinking, perception, and voluntary movement
Frontal Lobe	Planning, problem solving, and self-regulation
Temporal Lobe	Processing sounds, language, comprehension, and memory
Parietal Lobe	Interpreting sensory input, spatial awareness
Occipital Lobe	Visual processing and recognition
Cerebellum	Coordination of movement, balance, and posture
Hippocampus	Memory formation and learning
Amygdala	Processing emotions, particularly fear and attachment
Hypothalamus	Regulate hunger, sleep, and body temperature

Each of these structures develops rapidly during infancy and toddlerhood, influenced by genetics, experiences, and environmental factors. Early interactions, such as responsive caregiving and rich sensory experiences, help shape these brain areas and support overall development (Shonkoff & Phillips, 2000).

Topic hierarchy

11.1.1: Developmental Processes

11.1.2: Disorders Related to Brain Development

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11.1.1: Developmental Processes

Learning Objectives

1. Describe the process and purpose of synaptic pruning and when it typically occurs.
2. Define myelination.
3. Discuss how myelination supports cognitive and motor development.
4. Discuss the concept of brain plasticity and its impact on brain architecture and function, particularly in relation to early experiences.
5. Identify the importance of sensitive periods in early childhood.

Introduction

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

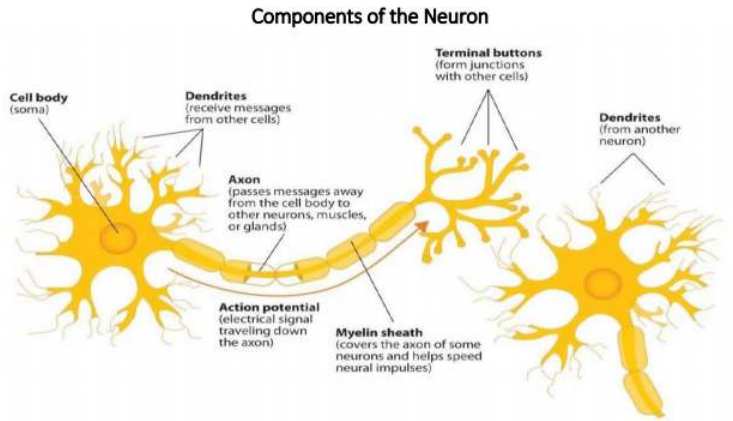


Figure 11.1.1.1: Components of the neuron. Image by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0

There is a proliferation of these dendrites during the first two years, so that by age 2, a single neuron might have thousands of dendrites. Following this dramatic increase, unused neural pathways will be eliminated, thereby strengthening those that are used.[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, resulting in the formation of thousands of new connections during infancy and toddlerhood. This period of rapid neural growth is referred *to as* **Synaptic Blooming**.[9] This activity is occurring primarily in the cortex, or the thin outer covering of the brain, involved in voluntary activity and thinking.

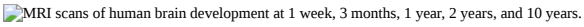


Figure **11.1.1.2**: MRI scans of the human brain. Image is in the public domain.

The prefrontal cortex, located behind the forehead, continues to grow and mature throughout childhood and undergoes 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 becomes increasingly able to regulate emotions, plan activities, strategize, and make better judgments. Of course, this is not fully accomplished in infancy and toddlerhood but continues throughout childhood and adolescence.

Myelination

When babies are born, the **myelin sheath**—a fatty coating that insulates neurons and speeds up the transmission of electrical signals—does not fully cover all neurons in the nervous system.

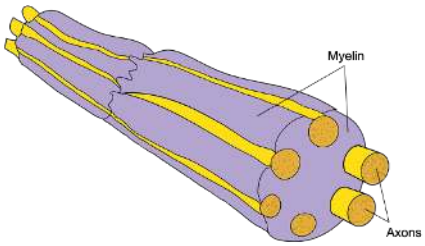


Figure 11.1.1.4. Unmyelinated nerve, where axons are not completely covered, similar to how the sheath looks at birth. Image by Chiara Mazzasette is licensed CC BY 4.0.

Instead, **myelination** occurs rapidly throughout infancy and early childhood, continuing into adolescence (Lebel & Deoni, 2018). This process is crucial for efficient brain communication, supporting essential functions such as movement, sensory processing, and cognitive development. Research indicates that **myelination is influenced by early experiences**, including stimulation, nutrition, and social interactions, highlighting the importance of a rich and responsive environment in shaping brain development (García-Sierra & Kuhl, 2017). For example, children who read more typically develop greater myelination in areas of the brain associated with reading skills (Takeuchi et al., 2016).

Plasticity

The brain is highly adaptable, especially in the early years of life. This ability to change and reorganize in response to experiences is called **plasticity**. Early in development, plasticity allows the brain to form and strengthen the connections necessary for learning, problem-solving, and adapting to new environments (Kolb & Gibb, 2011). Because young children's brains are still developing, they are particularly responsive to experiences, meaning both positive and negative environments can profoundly shape brain growth.

Synaptic Pruning

One of the most important processes in early brain development is **synaptic pruning**. During infancy and toddlerhood, the brain produces more neural connections (synapses) than it will ultimately need. By age three, a child's brain has about **twice as many synapses as an adult brain** (Stiles & Jernigan, 2010). As a child interacts with their environment, the brain strengthens frequently used connections while gradually eliminating weaker or unused ones—a process known as **synaptic pruning** (Huttenlocher & Dabholkar, 1997). This process, which continues into early childhood and beyond, allows the brain to become more efficient, refining networks that support language, motor skills, and cognitive development.

Experiences

A key aspect of early plasticity, neural connections, and pruning is **experience-expectant brain development**. The brain is "wired" to expect certain universal experiences—such as hearing language, seeing light, and forming emotional bonds—and requires these experiences for typical development (Greenough et al., 1987). This is often referred to as a sensitive period, or critical period, in development (Levine & Munsch, 2024). For example, infants are born with the ability to recognize and process language sounds. Still, if they are not exposed to spoken language, their brain's capacity to develop strong language networks diminishes. This underscores the importance of **rich, consistent, and nurturing experiences in early childhood**, as the brain actively develops in response to its environment.

However, not all early experiences are positive. **Trauma and chronic stress** can disrupt the brain's wiring process, affecting areas involved in emotional regulation, memory, and impulse control (Teicher et al., 2016). Early adversity, such as neglect or exposure to violence, can cause the brain to become hyper-responsive to stress, leading to long-term difficulties in managing emotions and behavior (Shonkoff et al., 2012). Fortunately, due to **neuroplasticity**, young children's brains have the capacity to recover, especially when they receive responsive caregiving and supportive interventions (Nelson et al., 2019).

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11.1.2: Disorders Related to Brain Development

Learning Objectives

1. Describe what Cerebral Palsy is and how it affects motor development.
2. Explain the characteristics, diagnostic criteria, and early signs of Autism Spectrum Disorder (ASD).

Disorders that affect brain development can impact many aspects of a child's growth, including motor skills, communication, behavior, and social interaction. In this section, we will explore two such disorders: Cerebral Palsy and Autism Spectrum Disorder (ASD).

Cerebral Palsy

Cerebral Palsy (CP) is a group of disorders that affect movement and muscle tone. It is caused by damage to the developing brain, most often before or during birth. CP affects a child's ability to control their muscles and can cause difficulties with motor skills such as walking, sitting, or reaching for objects. Symptoms of Cerebral Palsy can vary but typically include:

- Muscle stiffness (spasticity) or weakness
- Difficulty with coordination and balance
- Abnormal gait or difficulty walking
- Delayed motor skills, such as sitting or crawling
- Involuntary movements or tremors

There are different types of cerebral palsy, which are classified based on the type of movement problems they cause. These include spastic, dyskinetic, ataxic, and mixed types.



Figure 11.1.2.1. A young cerebral palsy client is receiving physical therapy services to improve mobility. Image by Martine Perret / UNMIT is licensed CC BY-NC 2.0

Diagnosis of CP is typically made after a child shows delays in reaching developmental milestones or displays unusual muscle tone. Medical professionals may use imaging techniques, such as MRIs and CT scans, in conjunction with developmental assessments, to confirm the diagnosis.

While genetic factors are not typically the cause of CP, certain genetic mutations may make a child more vulnerable to brain damage from events like lack of oxygen during birth. Additionally, brain injuries caused by infections or trauma during infancy can increase the risk.

Autism Spectrum Disorders

Autism Spectrum Disorder (ASD) is a developmental disorder that affects how a person thinks, interacts, and experiences the world. It is often referred to as a "spectrum" because it includes a wide range of symptoms and severity levels. Children with ASD may have difficulty with social interactions and communication and may engage in repetitive behaviors. The exact cause of ASD is

not fully understood, but a combination of genetic and environmental factors likely plays a role. Symptoms of Autism Spectrum Disorder may include:

- Difficulty with social communication, such as not making eye contact, not responding to their name, or struggling to understand social cues
- Repetitive behaviors, like hand-flapping, lining up toys, or repeating the same phrases
- Restricted interests, such as an intense focus on one activity or subject
- Sensory sensitivities, where a child might be overly sensitive or under-sensitive to lights, sounds, or textures

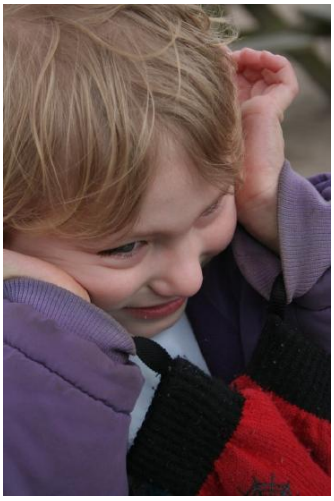


Figure 11.1.2.2. A young boy with autism is experiencing sensory overload due to hearing stimuli. Image is in the public domain.

Diagnosis and Screening Recommendations

ASD is typically diagnosed based on behavioral assessments and developmental screenings, which help to identify delays or differences in social and communication skills. Early diagnosis is crucial for effective treatment and intervention. Symptoms usually appear before the age of 3 and are often noticed when a child fails to meet developmental milestones in communication, socialization, or behavior.

The American Academy of Pediatrics (AAP; 2020) strongly recommends that all children be screened for developmental delays, including autism, during regular pediatric checkups. According to the AAP, screening for autism should occur at 18 and 24 months of age, with a follow-up screen if a child shows any signs of developmental delays or if parents or caregivers raise concerns.

Early **screening** is crucial for early diagnosis and intervention. When autism is identified early, children can receive therapies and supports that can greatly improve outcomes in communication, social skills, and behavior. Common screening tools include the Ages and Stages Questionnaire - Social/Emotional, Communication and Symbolic Behavior Scales (CSBS), and Modified Checklist for Autism in Toddlers (M-CHAT), which help identify children at risk for ASD and ensure timely referral for further evaluation if necessary.

Research

Research suggests that there is a strong genetic component to autism. While no single gene is responsible, studies show that mutations in certain genes may increase the likelihood of developing ASD. Families with one child with ASD have an increased risk of having another child with the disorder.

Neurological research, via MRI scans, has shown that children with autism have differences in the structure and function of the brain. For example, the **amygdala**, which plays a central role in processing emotions, has been one of the most studied areas in relation to ASD. It is involved in recognizing emotions in others (such as fear or happiness) and generating appropriate emotional responses. Studies have shown that individuals with autism often have differences in the size and functioning of the amygdala. For some, the amygdala is **enlarged** in early childhood but may show **abnormal growth patterns** as the child ages. This altered development is thought to contribute to difficulties with social recognition and processing emotions, which are hallmark symptoms of ASD (Baron-Cohen et al., 2009).

Additionally, research has found that:

- the prefrontal cortex may show reduced activation,
- the temporal lobe may function atypically and contribute to the difficulty in recognizing and interpreting facial expressions or social cues (McPartland & Pelphrey, 2012),
- there is usually a smaller cerebellar volume (Belmonte & Yurgelun-Todd, 2003),
- and/or the somatosensory cortex (responsible for processing sensory information) might also function atypically, causing either hypersensitivity or hyposensitivity to stimuli (Kern & Trivedi, 2012).

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11.2: Sensory Capacities

Learning Objectives

1. Describe the state of sensory development at birth.
2. Explain how newborns use sensory cues to interact with caregivers and their environment.
3. Identify milestones in visual and auditory development during the first six months of life.

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 well-developed the newborn is, especially in terms of 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. Due to their poor visual acuity, they look longer at checkerboards with fewer large squares than at those with many small squares. Infants' thresholds for perceiving a visual pattern are higher than those of 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 **11.2.1**: An infant looking up at the person feeding them. Image by Ben_Kerckx on Pixabay.

When viewing a person's face, newborns do not look at the eyes the way adults do; instead, 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, infants can also perceive depth perception in pictures (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 early 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 particularly sensitive to the frequencies of sounds in human speech and tend to 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; however, 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 becomes less sensitive to sounds that are part of an unfamiliar language.

Newborns also prefer their mother's voice 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 recall the Cat in the Hat study featured in the previous chapter, which illustrates this point.

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).



Figure 11.2.2: The responses of infants to different tastes. Image by Alice Vilela and CC BY 4.0.

Infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with either a smooth or textured surface preferred to look at a corresponding (smooth or textured) visual model of the pacifier. By four months, infants can match lip movements with speech sounds and recognize 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 enable the infant to see, touch, and organize their experiences in new ways. [30]

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SECTION OVERVIEW

11.3: Body Growth and Motor Development

Learning Objectives

1. Describe the changes in body size and proportions that occur from birth through toddlerhood.
2. Explain how body proportions, particularly head size, affect early motor development.
3. Recognize the signs and significance of growth spurts and how they may temporarily affect behavior and feeding patterns.

Proportions

Another dramatic physical change that takes place in the first several years of life is the change in body, both in size and proportion. 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 of our length. Imagine now how difficult it must be to raise one's head during the first year of life! Indeed, if you have ever seen a 2- to 4-month-old infant lying on their stomach trying to raise their head, you know how challenging this is.

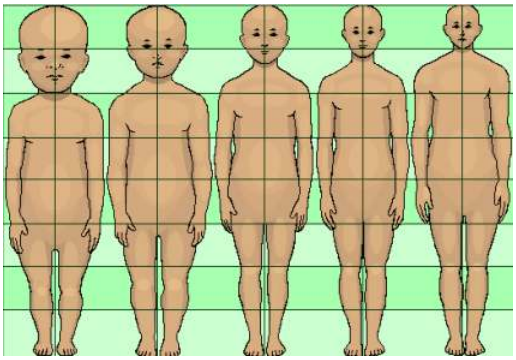


Figure 11.3.1: Shown from left to right: Human body proportions at birth, at 2 years, at 6 years, at 12 years, and 19 years. Image by Ephert is licensed under CC BY-SA 4.0.

In addition to their large head, infants also have large eyes, a small mouth and nose, and relatively fat cheeks. These features make babies appear cute, causing an attraction to take care of them (Kringelback et. al, 2016). Despite some of the unpleasant aspects of infant care (such as smells, round-the-clock feeding schedules, and bodily fluids), most adults still protect and nurture babies because of the profound effect their facial features have on us.



Figure 11.3.2. Young infant. Image by Nihal Karkala is in the public domain.

Weight and Length

Infants typically double their birthweight by 5 months and triple it by their first birthday (Berk, 2013). During this time, babies also grow in length, increasing about 10 inches, or 50% of their birth length, in their first year. The tremendous physical growth experienced during the first year will never be experienced at the same rate again. By the second year, growth has slowed but remains steady. Two-year-olds are approximately half the height they will be in adulthood. However, while height is highly genetic, the environment still plays a role in reaching its maximum potential (e.g., nutrition, environmental toxins, etc.)

To track the growth of infants and toddlers, healthcare providers use growth charts. These charts compare a child's weight and height to those of others of the same age and sex, helping doctors see if the child is developing at a typical rate. Concerns may be raised if a child's rate of growth changes dramatically from one check-up to the next.

One thing to note, is that while growth charts show growth on a seemingly continuous curve, growth doesn't happen in a steady, continuous way; instead, babies grow in spurts, meaning they may grow quickly at some times and more slowly at others (Berk, 2013). This is normal and part of how each child's body develops in its own way. An increase in the infant's appetite or irritability (Robock, 2023), as well as a change in sleep pattern (usually sleeping longer or taking more naps) may signal that a spurt is about to occur.

Topic hierarchy

11.3.1: Reflexes

11.3.2: Gross Motor Skills

11.3.3: Fine Motor Skills

11.3.4: Variability in Motor Development

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11.3.1: Reflexes

Learning Objectives

1. Define reflexes and explain their role in early neurological functioning.
2. Identify and describe common reflexes observed in newborns.

What are Reflexes

Infants are equipped with several reflexes, which are involuntary movements that occur 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 rapidly 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]

Common Infant Reflexes

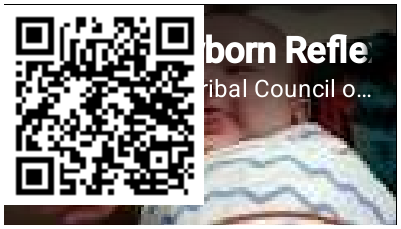
Video	Video Description and Text Link
	The presentation to the left shares the same information from the table below and illustrates the newborn reflexes. This video was produced as part of The Power of Your Newborn learning series by the Inter-Tribal Council of Michigan. Text link: https://www.youtube.com/watch?v=0vrdkzOnGgo&t=4s

Table **11.3.1.1**: Some Common Infant Reflexes. Table by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0 (modified by Antoinette Ricardo).

Reflex	Description	Image
Sucking	Suck on anything that touches the lips	 Figure 11.3.1.1. Infant sucking as it breast feeds. Image is in the public domain.
Rooting	Turning the head when the cheek is touched	 Figure 11.3.1.2. An adult's finger runs over the newborn's mouth, demonstrating the rooting reflex. Image is in the public domain.
Grasp	Fingers automatically grip anything that touches the palm of the hand	 Figure 11.3.1.3. An infant grasping an adult's finger. Image by Raul Luna is licensed under CC BY 2.0.
Babinski	The toes will fan out and curl when the sole of the foot is stroked from heel to toe	 Figure 11.3.1.4. The newborn's toes spread out, demonstrating the Babinski reflex. Image by Medicus of Borg is licensed under CC BY-SA 3.0.
Stepping	Legs move in a stepping-like motion when feet touch a smooth surface	 Figure 11.3.1.5. The newborn is held upright by an adult to demonstrate the stepping reflex. Image is in the public domain.

Reflex	Description	Image
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's pose).	 Figure **11.3.1.6**. Infant lying on back with right arm outstretched while left arm is flexed towards head. Image by Samuel Finlayson is licensed under CC BY-SA 4.0.
Moro	A sudden noise or loss of support to the head and neck will cause infants to spread out their arms and legs, then quickly contract the limbs inward	 Figure **11.3.1.7**. Newborn lying on back with arms outstretched above head and legs contracting inward. Image is in the public domain.

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11.3.2: Gross Motor Skills

Learning Objectives

1. Describe the sequence of gross motor development in infancy and toddlerhood.
2. Identify typical gross motor milestones from birth to age 2.

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 bringing the chin up when lying on the stomach, lifting the chest, rocking back and forth on hands and knees, and then crawling. However, it also involves exploring an object with one's feet, as many babies do as early as 8 weeks of age, when seated in a carrier or other device that frees the hips. This may be easier than reaching for an object with the hands, which requires much more practice (Berk, 2007). And sometimes an infant will try to move toward an object while crawling and, surprisingly, move backward because of the greater amount of strength in the arms than in the legs! This also tends to lead infants to pull up on furniture, usually to reach 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 table outlines the major **milestones** (behaviors or physical skills observed in infants and children as they grow and develop, typically occurring within the normal range) that typically occur in children during their first formative years. [23]

Table **11.3.2.1**: Gross Motor Milestones (Developmental Milestones by the CDC is in the public domain)

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



Figure **11.3.2.1**: An infant playing in the sand. Image by Andres and Antoinette Ricardo used with permission.

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11.3.3: Fine Motor Skills

Learning Objectives

1. Describe the development of fine motor skills in infants and toddlers.
2. Identify typical fine motor milestones from birth to age 2.

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 can 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 not the thumbs.



Figure 11.3.3.1: An infant feeding themselves. Image by Matt Preston is licensed under CC BY-SA 2.0.

The use of the thumb typically begins around 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 objects, and infants take great delight in this newfound skill. 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, considering how difficult it would have been just a few months earlier. [26]

Physical Fine Motor Milestones

While fine motor skills are slower to develop (following 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 transition from having no intentional fine motor control to being able to manipulate objects for play and learning, as well as begin to care for themselves. The following table outlines the major milestones in fine motor development.

Table 11.3.3.1: Fine Motor Milestones by the CDC is in the public domain.

Typical Age	What Most Children Do by This Age
2 months	• Grasps reflexively • Does not reach for objects • Holds hands in a fist
4 months	• Brings hands to mouth • Uses hands and eyes together, such as seeing a toy and reaching for it • Follows moving things with eyes from side to side • Can hold a toy with whole hand (palmar grasp) and shake it and swing at dangling toys
6 months	• Reaches with both arms • Brings things to mouth • Begins to pass things from one hand to the other
9 months	• Puts things in mouth • Moves things smoothly from one hand to the other • Picks up things between thumb and index finger (pincer grip)
1 year	• Reaches with one hand • Bangs two things together • Puts things in a container, takes things out of a container • Lets things go without help • Pokes with index (pointer) finger
18 months	• Scribbles on own • Can help undress herself • Drinks from a cup • Eats with a spoon with some accuracy • Stacks 2-4 objects
2 years	• Builds towers of 4 or more blocks • Might use one hand more than the other • Makes copies of straight lines and circles • Enjoys pouring and filling • Unbuttons large buttons • Unzips large zippers • Drinks and feeds self with more accuracy

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11.3.4: Variability in Motor Development

Learning Objectives

1. Explain the typical sequence and patterns of gross and fine motor development in infancy and toddlerhood.
2. Analyze how cultural practices and caregiving environments influence the timing of motor milestones, including toilet-learning approaches.
3. Describe the role of motor and cognitive development in toilet learning.

The Sequencing of Motor Milestones in Infancy and Toddlerhood

Motor development in infancy and toddlerhood follows a predictable sequence, with infants generally acquiring gross motor skills before fine motor skills. This progression follows a cephalocaudal (head-to-toe) and proximodistal (center-outward) pattern (Santrock, 2021). Typical motor milestones include lifting the head, rolling over, sitting unsupported, crawling, standing, and eventually walking. These milestones are largely influenced by genetic factors, but environmental conditions also play a critical role.

Cultural practices can shape motor development by either accelerating or delaying certain milestones. For example, in some African and Caribbean cultures, infants are actively encouraged to practice standing and walking through stretching and upright carrying techniques, often leading to earlier independent walking (Karasik et al., 2018). Conversely, in cultures where infants spend more time in confined spaces, such as being swaddled or worn for extended periods, motor development may progress at a slower rate (Super & Harkness, 2002).



Figure 11.3.4.1. A village woman is carrying her sleeping child in a baby wrap. Image by Ammad Rasool is licensed by Pexels.

In contemporary Western settings, the use of restrictive devices, such as baby walkers and bouncers, as well as prolonged time in car seats, has raised concerns about delayed motor skill acquisition. Research suggests that infants who have more opportunities for free movement and floor play tend to develop stronger muscles and coordination compared to those who spend extended time in containment devices (Zachry & Kitzmann, 2011). Free movement supports not only physical growth but also cognitive, social, and emotional development, as children engage in sensory exploration and social interactions through movement.

Broader Implications

The development of motor skills is closely linked to other domains of growth. As infants gain mobility, they also expand their cognitive abilities by exploring their surroundings, which fosters problem-solving skills and spatial awareness (Bertenthal & Campos, 1990). Additionally, improved motor coordination supports fine motor skills, which are crucial for self-help tasks such as feeding and dressing. Social and emotional development also benefits, as toddlers gain confidence and independence through movement, which leads to increased interactions with caregivers and peers.



Figure 11.3.4.2. A young girl is practicing toilet learning with her stuffed bear. Image by Manish Bansal is licensed CC BY 2.0.

One significant area influenced by motor skill development is toilet learning. The ability to control elimination depends not only on physical maturation, such as sphincter control and gross motor stability, but also on cognitive awareness and social expectations. Cultures differ significantly in how they approach the toilet learning process. In parts of East Asia and Africa, caregivers practice elimination communication from infancy, responding to infants' cues and encouraging toilet use from a very young age (Boucke, 2003). In contrast, Western cultures often take a more child-centered approach, emphasizing the child's readiness and active participation in the learning process.

In the United States, best practices for toilet learning emphasize a child-centered approach, recognizing that each child develops at their own pace. The American Academy of Pediatrics (AAP, 2016) recommends waiting until a child shows clear readiness indicators, such as:

- staying dry for extended periods,
- demonstrating an interest in using the toilet, and
- being able to communicate their needs.

Positive reinforcement, consistency, and avoiding punishment are key considerations in ensuring a smooth and stress-free transition for the child.

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11.4: Safety

Learning Objectives

1. Identify common causes of nonfatal and fatal injuries among infants and toddlers.
2. Describe car seat safety guidelines and the effectiveness of proper restraint use.
3. Define Abusive Head Trauma and Shaken Baby Syndrome.
4. Explain the characteristics, consequences, and strategies for prevention of Abusive Head Trauma and Shaken Baby Syndrome.

Safety

There are different risks to infant safety. According to the CDC, nonfatal injury rates vary 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. Infants should never be left unattended on a high surface, as you never know when they may start rolling over.

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 aged 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 a single year, more than 618,000 children aged 0-12 rode in vehicles without using a child safety seat, booster seat, or seat belt at least some of the time.
- Of the children ages 12 years and younger who died in a crash in 2016 (for which restraint use was known), 35% were not buckled up.[67]

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

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

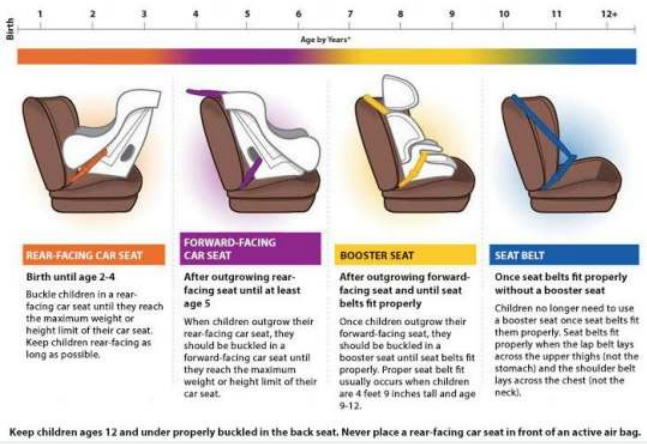


Figure 11.4.1: The different types of car seats based on age. Image by the CDC is in the public domain.

Shaken Baby Syndrome

Here is a PSA from the Centers 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 the 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 often the biological father, 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 caregivers.

The Bottom Line

- Shaking a baby can cause death or permanent brain damage. It can result in lifelong 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, or 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 driving 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 11.4.2: Medical professionals caring for an infant. Image by the U.S. Air Force is in the public domain.

Abusive Head Trauma

Shaken baby syndrome is a form of abusive head trauma (AHT), a severe form of physical child abuse that results in 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]

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SECTION OVERVIEW

11.5: Health

Learning Objectives

1. Describe common physical conditions in infancy.
2. Identify normal patterns of bowel movements and urination in infants and recognize when medical evaluation may be necessary.
3. Explain the symptoms and basic management strategies of frequent infant illnesses.
4. Recognize when a fever or other symptoms in an infant warrant medical attention.

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 caregivers learning what is normal for their infant and becoming 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 undergo numerous 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 11.5.1: An infant getting their diaper changed. Image by Kevin Phillips is licensed under CC BY 2.0.

Colic

Many infants are fussy in the evenings, but if the crying does not stop and gets worse throughout the day or night, it may be caused by colic. According to the American Academy of Pediatrics, approximately one-fifth of all infants develop colic, typically beginning 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 at any time, although they often worsen in the early evening.

Colic typically improves or resolves by the age of 3 or 4 months. There is no definite explanation for why some infants get colic. Healthcare providers can help ensure that 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 11.5.2: A father holding a crying infant. Image by David D is licensed under CC BY 2.0.

Teething

Although newborns usually have no visible teeth, baby teeth typically begin to appear around 6 months after birth. During the first few years, all 20 baby teeth will erupt through the gums, and most children will have their full set of these teeth in place by the time they are 3 years old.

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, 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. However, if an infant is not gaining weight or exhibits other signs of illness, a healthcare provider should be consulted.



Figure 11.5.3: A father holding his baby with a cloth protecting his shoulder from spit-up. Image by Colin is licensed under CC BY 2.0.

Urination

Infants urinate as often as every 1 to 3 hours or as infrequently as every 4 to 6 hours. In cases of sickness or when the weather is very hot, urine output may drop by half and still be considered 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 skin irritation resulting from 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. However, for many infants, the liver is not yet fully functional in its first few days after birth. As a result, the level of bilirubin in the blood becomes too high, causing the infant's skin to appear slightly yellow—this is known as jaundice. Although jaundice is common and usually not serious, in some cases, high levels of bilirubin could cause brain injury. A healthcare provider should evaluate all infants with jaundice. 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, healthcare providers prescribe phototherapy—a treatment that uses a special lamp—to help break down the bilirubin in their bodies.



Figure **11.5.4**: An infant receiving treatment for jaundice. Image by Andres and Antoinette Ricardo used with permission.

Common Illnesses

During infancy and toddlerhood, children are particularly vulnerable to a range of illnesses due to their developing immune systems and exposure to new environments. Some common illnesses during this stage include:

1. **Colds and Upper Respiratory Infections** - These are caused by viruses, such as the rhinovirus, and are very common in young children. Symptoms include a runny nose, cough, and mild fever.
2. **Ear Infections (Otitis Media)** - Bacterial or viral infections of the middle ear can cause pain, irritability, and sometimes fever. They are particularly common after upper respiratory infections.
3. **Gastroenteritis (Stomach Flu)** - Often caused by viruses such as rotavirus or norovirus, and gastroenteritis leads to diarrhea, vomiting, fever, and dehydration.
4. **Respiratory Syncytial Virus (RSV)**- RSV is a common virus that affects the respiratory system and can cause bronchiolitis or pneumonia, particularly in infants and toddlers.
5. **Hand, Foot, and Mouth Disease**- Caused by a virus, this illness includes a fever, mouth sores, and a rash on the hands and feet. It is common in children under age 5.

Fever

Most childhood illnesses are self-limiting, but many are accompanied by fever. Parents and caregivers should always consult a physician when a fever reaches 105 degrees Fahrenheit or above, as this can be life-threatening, and the illness causing the fever may require immediate medical attention. However, even a low-grade fever in young children should be closely monitored because it may be a sign of a serious infection. Babies and toddlers, even young children, cannot tell us what they are feeling, so adults should take extra precautions to watch for and correctly interpret symptoms of illness as they occur.

Topic hierarchy

11.5.1: Vaccinations

11.5.2: Sleep

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11.5.1: Vaccinations

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 cause a little discomfort, but the diseases they can prevent can cause a lot more harm. Immunization shots, also known as vaccinations, are essential. They protect against diseases such as measles, mumps, rubella, hepatitis B, polio, diphtheria, tetanus, and pertussis (whooping cough). Immunizations are important for both adults and 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, making them harmless. 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 a safer and more effective 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 potential side effects, helps people make informed decisions about vaccination.



Figure **11.5.1.1**: A nurse giving an infant vaccinations. Image by Maria Immaculata Hospital is licensed under CC BY-SA 4.0.

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 the FDA determines 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 the disease starts to drop when a vaccine is licensed. Vaccines are the most effective tool we have to prevent infectious diseases.

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 a low-grade fever) and typically resolve within a few days.[53] Serious side effects after vaccination, such as severe allergic reactions, 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.

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, 2011). Researchers suspected that the primary cause of the outbreak was the waning effectiveness of pertussis vaccines in older children, recommending a booster vaccination for 11–12-year-olds and also for pregnant women (Zacharyczuk et al., 2011a; Zacharyczuk et al., 2011b). 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, 2011). 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 control of numerous infectious diseases, including smallpox, polio, mumps, chickenpox, and meningitis.



Figure **11.5.1.2**: These two young children contracted polio. Image by the CDC is in the public domain.

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

Although children receive 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 are two or more vaccines that could be given individually, combined into one shot. Children get the same protection as they do from individual vaccines given separately, but with fewer shots.[57]

One common misapprehension is that the vaccine itself might cause the disease it is intended to immunize 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 would to a real infection, allowing the body to recognize and fight the vaccine-preventable disease in the future. Sometimes, after receiving a vaccine, an imitation infection can cause minor symptoms, such as a 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 garnered significant media attention, leading to a decline in British immunization rates from 91 percent in 1997 to nearly 80 percent by 2003, accompanied by a subsequent rise in measles cases (Devlin, 2008). A prolonged investigation by the British Medical Journal revealed that not only was the link in the study nonexistent, but also that Dr. Wakefield had falsified data 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 11.5.1.3: A baby with measles. Image by CDC Global is licensed under CC BY 2.0.

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

The Immunization Schedule

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

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

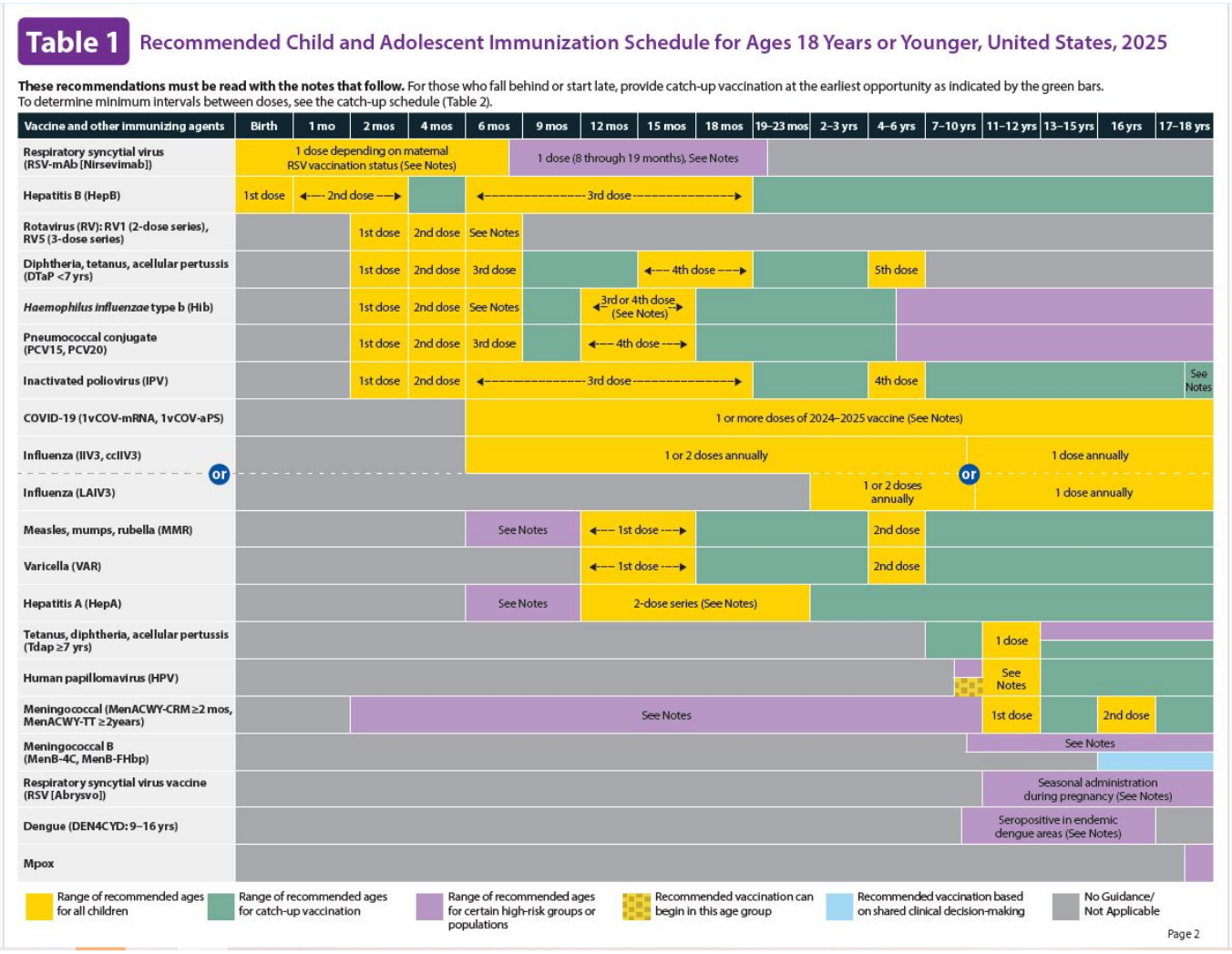


Figure **11.5.1.4**: Immunization schedule. Image found on page 2 of the Color Schedule (pdf) by the CDC is in the public domain.

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11.5.2: Sleep

Learning Objectives

1. Describe typical infant sleep patterns and changes during the first two years of life.
2. Explain the major categories of Sudden Unexpected Infant Death (SUID) and related risk factors.
3. Identify current safe sleep practices recommended to reduce the risk of SIDS and other sleep-related deaths.
4. Compare and contrast cultural perspectives on co-sleeping and evaluate the influence of sleeping environments on infant safety.

Sleep Patterns

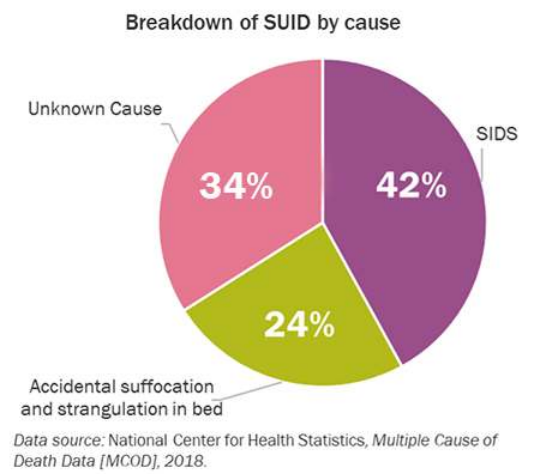
A newborn typically sleeps approximately 16.5 hours per 24-hour period. This is typically polyphasic sleep, in which the infant accumulates 16.5 hours over several sleep periods throughout the day (Salkind, 2005). The infant averages 15 hours per 24-hour period by one month and 14 hours by 6 months. 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]

Safe Sleep

Sudden Unexpected Infant Deaths (SUID)

Each year in the United States, there are about 3,500 Sudden Unexpected Infant Deaths (SUID). These deaths occur among infants less than one year old and have no immediately obvious cause (CDC, 2015). The three commonly reported types of SUID are:

- **Sudden Infant Death Syndrome (SIDS): SIDS** is identified when the death of a healthy infant occurs suddenly and unexpectedly, and medical and forensic investigation findings (including an autopsy) are inconclusive. SIDS is the leading cause of death in infants 1 to 12 months old, and approximately 1,529 infants died of SIDS in 2018 (CDC, 2022)[1]. 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).
- **Unknown Cause**: The sudden death of an infant less than one year of age that cannot be explained because a thorough investigation was not conducted, and the cause of death could not be determined.
- **Accidental Suffocation and Strangulation in Bed**: Reasons for accidental suffocation include: Suffocation by soft bedding, another person rolling on top of or against the infant while sleeping, an infant being wedged between two objects such as a mattress and wall, and strangulation such as when an infant's head and neck become caught between crib railings. The percentages of infants who died based on each of the three types are listed in Figure 11.5.2.1.



Data source: National Center for Health Statistics, *Multiple Cause of Death Data [MCOD], 2018.*

Figure 11.5.2.1. According to the CDC's 2022 statistics, there were approximately 3,700 SUID cases in the United States. Source: CDC/NCHS, National Vital Statistics System[1]

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 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.



Figure 11.5.2.2: A baby sleeping safely. Image by the U.S. Department of Health and Human Services is in the public domain.

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, the decline has slowed.

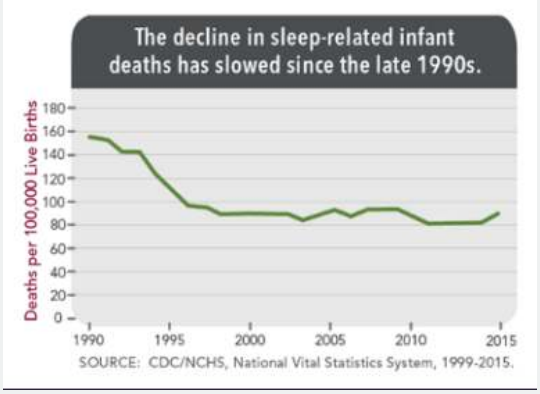


Figure 11.5.2.3: A graph showing the decline in sleep-related infant deaths. Image by the CDC is in the public domain.

In 2012, the "Back to Sleep" campaign was renamed 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 the baby on their 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 the baby's sleep area.

- Do not smoke during pregnancy or allow smoking around the baby.
- Consider giving the baby a pacifier.
- Do not let the baby get too hot during sleep.
- Get regular health care (including vaccines).
- Avoid products that contradict safe sleep recommendations, especially those that claim to prevent or reduce the risk of Sudden Infant Death Syndrome (SIDS).
- Do not use heart or breathing monitors to reduce the risk of SIDS. [74]

Should infants sleep in the same bed as their parents?

Colvin, Collie-Akers, Schunn and Moon (2014) analyzed a total of 8207 deaths from 24 states during 2004–2012 that were contained in the National Center for the Review and Prevention of Child Deaths Case Reporting System, a database of death reports from state child death review teams. The results indicated that younger victims (0-3 months) were more likely to die from bed-sharing and sleeping in an adult bed/on a person. A higher percentage of older victims (4 months to 364 days) rolled into objects in the sleep environment and changed position from side/back to prone. Carpenter et al. (2013) compared infants who died of SIDS with a matched control and found that infants younger than three months old who slept in bed with a parent were five times more likely to die of SIDS compared to babies who slept separately from the parents, but were still in the same room. They concluded that bed sharing, even when the parents do not smoke, take alcohol, or use drugs, increases the risk of SIDS. However, when combined with parental smoking and maternal alcohol consumption and/or drug use, risks associated with bed sharing greatly increase.

The two studies discussed above were based on American statistics. What about the rest of the world? Co-sleeping is a common practice in many cultures, primarily due to a more collectivist perspective that fosters a close parent-child bond and interdependent relationship (Morelli, Rogoff, Oppenheim, & Goldsmith, 1992). In countries where co-sleeping is common, however, parents and infants typically sleep on floor mats and other hard surfaces, which minimize the suffocation that can occur with bedding and mattresses (Nelson, Schiefenhoevel, & Haimerl, 2000).

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SECTION OVERVIEW

11.6: Nutrition

Learning Objectives

1. Explain the importance of responsive, on-demand feeding in infancy.
2. Identify USDA-recommended meal patterns for infants and toddlers.
3. Describe foods that should be avoided in early childhood to reduce choking, allergic reactions, and nutritional risks.
4. Discuss the long-term health risks associated with early exposure to added sugars and processed foods.

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.

On-Demand Feeding for Young Infants

Feeding infants on demand—responding promptly to their hunger cues rather than adhering to a strict schedule—is widely recommended for promoting optimal growth and development. This responsive feeding approach aligns with infants' natural hunger and satiety signals.

Research indicates that demand-fed infants tend to have better cognitive outcomes compared to those fed on a schedule. A study analyzing data from the Avon Longitudinal Study of Parents and Children found that schedule-fed babies scored lower in standardized tests and IQ assessments up to 14 years of age, even after adjusting for various confounding factors (Iacovou & Sevilla, 2013). This suggests that feeding on demand may have long-term benefits for a child's cognitive development.

Moreover, on-demand feeding is associated with longer breastfeeding durations. A study published in *PLOS ONE* found that mothers who adopted infant-led feeding practices, which involve feeding in response to the baby's hunger cues, were more likely to continue breastfeeding for extended periods (Brown & Lee, 2013). This extended breastfeeding duration provides ongoing nutritional and immunological benefits to the infant.

Responsive feeding also plays a crucial role in establishing healthy eating behaviors. By recognizing and responding to their hunger and fullness cues, infants learn to self-regulate their food intake, which can help prevent overfeeding and its associated risks, such as obesity (Black & Aboud, 2011).

USDA Infant Meal Patterns

As infants age or enter early learning programs, the United States Department of Agriculture Food and Nutrition Service (USDA) requirements may dictate the amount that must be offered, either via bottle or table food, at each meal. This does not mean infants have to be fed on a strict schedule, but it is flexible to both the program and the infant's needs. Its goal is to have a standard by which programs can account for offering essential nutrients needed for growth and development.

The USDA provides the following guidance for the daytime feeding of infants and toddlers.

Table **11.6.1**: Infant Meal Patterns (Infant Meals by the USDA is in the public domain)

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

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

USDA Toddler Meal Patterns

Table **11.6.2**: Meal Patterns for Children (1-2 years) (Child and Adult Meals by the USDA is in the public domain)

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

Note: All serving sizes represent the minimum quantities of food components that must be served.

Food Safety

Certain foods should be avoided to promote the health and safety of infants and toddlers. The introduction of inappropriate foods can increase the risk of choking, allergic reactions, and digestive issues. The next section will explore this topic in more detail, specifically introducing solid foods.

Foods That Pose a Choking Hazard

Infants and toddlers are still developing their ability to chew and swallow, making some foods particularly dangerous. According to the American Academy of Pediatrics (AAP), foods that should be avoided due to choking risk include whole grapes, hot dogs (unless cut into very small pieces), popcorn, nuts, raw vegetables, and hard candies (American Academy of Pediatrics, 2010). Foods with a sticky or thick consistency, such as peanut butter or marshmallows, should also be given with caution, as they can be difficult for young children to manage.

Honey and the Risk of Infant Botulism

Honey should never be given to infants under 12 months due to the risk of **infant botulism**, a rare but serious illness caused by *Clostridium botulinum* spores, which can colonize an infant's immature digestive system and produce harmful toxins (Centers for Disease Control and Prevention [CDC], 2024). Even small amounts of honey in processed foods or homemade preparations can be dangerous for young infants.

Cow's Milk and Alternatives Before One Year

Whole cow's milk should not be introduced before the age of one year. While dairy products like yogurt and cheese can be introduced around six months, cow's milk lacks the necessary iron content. It can lead to iron-deficiency anemia (Committee on Nutrition, AAP, 2014). Additionally, plant-based milk alternatives (e.g., almond, oat, or rice milk) should not be used as a primary beverage in infancy unless medically indicated, as they may not provide adequate nutrients for growth and development.

Highly Processed and Sugary Foods

The introduction of added sugars should be avoided in infancy and kept to a minimum in toddlerhood. Research indicates that early exposure to sugary foods and beverages, including fruit juices and sweetened cereals, increases the likelihood of developing unhealthy eating habits and obesity later in life (Vos et al., 2017). The AAP recommends avoiding fruit juice before the age of one and limiting juice intake thereafter. Highly processed foods with excessive sodium and artificial additives should also be minimized, as they may contribute to long-term health issues.

Topic hierarchy

11.6.1: Breastfeeding

11.6.2: Starting Solids

11.6.3: Malnutrition

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11.6.1: Breastfeeding

Learning Objectives

1. Describe the nutritional and immunological benefits of breastfeeding for infants.
2. Identify maternal health benefits associated with breastfeeding.
3. Discuss challenges and societal factors that influence breastfeeding practices.
4. Compare historical and contemporary perspectives on breastfeeding and the use of formula.

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 11.6.1.1. A nurse helps a new mother to breastfeed. Image by the Military Health System is in the public domain.

Maternal Benefits of Breastfeeding

Several recent studies have reported that it is not just babies who 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 typically stop breastfeeding at around 6-8 weeks, often to return to work outside the home (USDHHS, 2011). Mothers can continue to provide breast milk to their babies by expressing and freezing it for later use, or by being available to their infants during 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 is readily available without the need for purchase. 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 some challenge the belief that breast milk is free. For breast milk to be completely beneficial for infants, the mother's life choices will ultimately affect the quality of the nutrition an infant receives. Let's consider the nutritional intake of the mother. Breastfeeding will 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 wide variety of vegetables and fruits must be consumed, accompanied by the right proportions and amounts of whole grains, dairy products, and healthy fat sources. 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 infants in the late 1800s. In the early 20th century, breastfeeding began to experience another decline. By the 1950s, it was practiced less frequently as formula began to be viewed as superior to breast milk.



Figure 11.6.1.2. A wet nurse feeding an infant in 1856. Image is in the public domain.

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 they are informed about the benefits of breastfeeding and given support and encouragement to help their infants become accustomed to taking the breast. This does not always happen immediately, and first-time mothers, especially, can become upset or discouraged. In this case, lactation specialists and nursing staff can encourage the mother to keep trying until the baby and mother are comfortable with the feeding. [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 a lack of personal comfort with nursing, the time commitment required for nursing, an inadequate or unhealthy diet, and a desire for more convenience and flexibility in terms of 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 one year of age (as opposed to cow's milk, goat's milk, or follow-on formula). It can be used in addition to breastfeeding (as a supplement) or as an alternative to breast milk.

The most commonly used infant formulas contain purified cow's milk whey and casein as protein sources, 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 **11.6.1.3**. A father bottle-feeding his infant. Image by Ilya Haykinson is licensed under CC BY-SA 2.0.

One early argument in favor of promoting breastfeeding was that it fosters bonding and healthy emotional development in 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.

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11.6.2: Starting Solids

Introduction of Solid Foods

The American Academy of Pediatrics recommends introducing children to foods other than breast milk or infant formula when they are approximately 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:

- The child can sit with little or no support.
- The child has good head control.
- The child opens their 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 specific 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, cheeses, and more.

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

Children should be allowed to try one food at a time initially, and there should be a 3- to 5-day wait before introducing another food. This helps caregivers see if the child has any problems with that food, such as food allergies.



Figure **11.6.2.1**: A baby being fed solid food. Image by Ben_Kerckx on Pixabay.

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

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

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11.6.3: Malnutrition

Learning Objectives

1. Define milk anemia, marasmus, and kwashiorkor.
2. Identify the symptoms and causes of severe malnutrition disorders.
3. Explain the long-term effects of early childhood malnutrition on cognitive and behavioral development.
4. Describe the signs, causes, and implications of failure to thrive (FTT) in infants and toddlers.

Child Malnutrition

There can be serious effects on 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 who 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 11.6.3.1: A child suffering from wasting. Image by the CDC is in the public domain.

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

Milk Anemia

Milk Anemia in the United States: About 9 million children in the United States are malnourished (Children's Welfare, 1998). Many more still suffer from milk anemia, a condition in which excessive milk consumption leads to a deficiency of iron in the diet. This can be due to the practice of giving toddlers milk as a pacifier, such as when resting, riding, or waking up. 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 also interferes with the absorption of iron in the diet. Many preschools and daycare centers offer toddlers a drink after they have finished their meal 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 the age of two, when growth rates are at their highest. Parents may express concern about picky eating habits, poor weight gain, or a smaller size compared to peers of similar age. Physicians often identify FTT during routine office visits, when a child's growth parameters are not aligning with growth curves.



Figure 11.6.3.2: FTT is often identified during routine pediatric office visits. Image by OPENPediatrics and Anne Marie K McFee is licensed CC BY-NC-ND 4.0.

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 caregivers' actions (environmental), including an 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 receiving sufficient nutrition may appear content, so caregivers do not offer feedings of sufficient frequency or volume. Similarly, a child with severe acid reflux who appears to be in pain while eating may make a caregiver hesitant to offer sufficient feedings.[43]

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CHAPTER OVERVIEW

12: Cognitive Development in Infancy and Toddlerhood

To better understand the wide range of cognitive development that infants and toddlers undergo, it is essential to analyze and comprehend various theories related to their growth and development, as well as explore ways to support language and cognition.

- 12.1: Piaget's Theory of Cognitive Development
- 12.2: Theory of Core Knowledge
- 12.3: Learning
- 12.4: Cognitive Processes
  - 12.4.1: Memory
  - 12.4.2: Attention
  - 12.4.3: Executive Function
  - 12.4.4: Social Cognition
- 12.5: Cognitive Milestones
- 12.6: Differences in Cognitive Abilities
- 12.7: Language Development
- 12.8: Language Milestones
- 12.9: Promoting Cognitive and Lanugage Development

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12.1: Piaget's Theory of Cognitive Development

Learning Objectives

1. Describe the characteristics and developmental tasks of Piaget's sensorimotor stage.

Jean Piaget is the most notable theorist in the field of children's cognitive development. He believed that children's cognitive development occurs 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 and toddlerhood.[1]

Piaget and Sensorimotor Intelligence

Piaget describes intelligence in infancy as **sensorimotor,** meaning it is based on direct, physical contact. Infants taste, feel, pound, push, hear, and move 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-year-olds.

Table **12.1.1**: Substages of Piaget’s Sensorimotor Stage[2]

Substage	Age	Description
Substage One: Simple Reflexes	Birth to 1 month	This active learning begins with automatic movements or reflexes. A ball comes into contact with an infant's cheek and is automatically sucked on and licked.
Substage Two: Primary Circular Reactions	1 to 4 months	The infant begins to discriminate between objects and adjust responses accordingly as reflexes are replaced with voluntary movements. An infant may accidentally engage in a behavior and find it interesting, such as making a vocalization. This interest motivates trying to do it again and helps the infant learn a new behavior that originally occurred by chance. Initially, most actions are focused on the body, but in the months to come, they will be directed more toward objects.
Substage Three: Secondary Circular Reactions	4 to 8 months	The infant becomes increasingly actively engaged with the outside world and takes delight in being able to make things happen. Repeated motion brings particular interest as the infant can 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 the 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 is now 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 Six: Internalization of Schemes and Early Representational Thought	18 months to 2 years	The child is now able to solve problems using mental strategies, recall information heard days before, repeat it, engage in pretend play, and locate objects that have

Substage	Age	Description
		been moved, even when they are 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 prevents the child from turning 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 12.1.1: An infant sitting in a highchair. Image by holycalamity is licensed under CC BY-SA 2.0.

Evaluating Piaget's Sensorimotor Stage

Piaget introduced a new perspective on infants and toddlers, suggesting that their primary 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. Over the past several decades, sophisticated experimental techniques have been developed to study infants, resulting in 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 make when children develop object permanence. Infants appear to be able to recognize that objects have permanence at much younger ages (as young as 3.5 months) than Piaget proposed (between 6 and 8 months old).

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 for the toy at location A initially. However, when the toy is subsequently hidden at location B, they make the mistake of continuing to search for it at location A. This common mistake is referred to as an A-not-B error. 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 consistently appear (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).

Video	Video Description and Text Link
	Demonstration of the A not B error with an older infant. Text link: https://www.youtube.com/watch?v=NDAEvLaW_lw

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

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12.2: Theory of Core Knowledge

Learning Objectives

1. Define the theory of core knowledge.
2. Describe the violation of expectation method.
3. Explain how the theory of core knowledge interacts with experience to support cognitive development in infancy and toddlerhood.

The **theory of core knowledge** proposes that infants are born with innate cognitive systems that enable them to make sense of the world. Unlike Piaget's view that all knowledge is constructed through direct interaction with the environment, this theory suggests that some fundamental knowledge is hardwired into the brain at birth. Researchers argue that these core domains of knowledge—such as understanding objects, numbers, space, and other people—have evolved to support survival and learning (Spelke & Kinzler, 2007).

Violation of Expectation and Early Cognitive Abilities

One of the key methods researchers use to study core knowledge in infants is the *violation-of-expectation* method. This approach measures how babies react to events that contradict their expectations about how the world works. If an infant looks longer at an event that defies logical or physical principles, it suggests that they have an expectation of how things *should* behave, indicating early cognitive understanding (Baillargeon, 2004).

For example, Baillargeon (1987) conducted a famous study on object permanence—an infant's understanding that objects continue to exist even when out of sight. She found that 3.5-month-old infants looked longer at an event where a moving screen appeared to pass through a hidden object, suggesting they understood that the object should still be there. This directly challenges Piaget's belief that object permanence develops later in infancy.

Similarly, studies on early numerical understanding have shown that infants may possess a primitive sense of numbers. Wynn (1992) demonstrated that 5-month-olds looked longer when an expected number of objects did not appear in a simple addition or subtraction task, suggesting they had some understanding of numerical relationships.

Beyond knowledge of objects and numbers, research suggests that infants also have an early understanding of social behavior. A notable study conducted by Hamlin, Wynn, and Bloom (2007) investigated how infants as young as 6 months evaluate social interactions. In this study, infants watched a scene in which a wooden character (such as a simple geometric shape with eyes) attempted to climb a hill. In one condition, a "helper" character assisted the climber by pushing it up the hill. In another condition, a "hinderer" character prevented the climber from reaching the top.

After observing these interactions, infants were given the opportunity to reach for one of the two characters. The results showed that most infants preferred the *helper* over the *hinderer*, indicating that even before they can speak, babies make judgments about social behavior and may have an early form of moral reasoning. This study supports the notion that humans possess an innate sensitivity to prosocial behavior, which may confer an evolutionary advantage by fostering cooperation and social bonding (Hamlin et al., 2007).

Video	Video Description and Text Link
	The video *"Can Babies Tell Right from Wrong?"*, shared by The New York Times, documents research on the Theory of Core Knowledge at Yale University's Infant Cognition Center. Text link: https://www.youtube.com/watch?v=HBW5vdhr_PA

Implication

The theory of core knowledge highlights that infants enter the world with more cognitive abilities than previously thought. However, while these early abilities provide a foundation for learning, experience, and social interactions are still essential for shaping and expanding knowledge. As infants grow, their innate understanding is refined through engagement with their environment, demonstrating the interplay between biological predispositions and experience in cognitive development.

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12.3: Learning

Learning Objectives

1. Differentiate between classical conditioning, operant conditioning, and social learning theory.
2. Identify examples of how conditioning and modeling influence early behaviors and emotional responses.
3. Describe strategies caregivers and professionals can use to support infant and toddler learning.

Infants and toddlers learn rapidly through their interactions with the environment, and three key mechanisms that shape their early learning are classical conditioning (Pavolv), operant conditioning (Watson and Skinner), and social learning (Bandura). Understanding the application of these theories during infancy and toddlerhood provides insight into how young children develop expectations and behaviors in response to their surroundings.

Conditioning

Classical Conditioning

Classical conditioning occurs when an infant begins to associate two stimuli, leading to a learned response. One of the most well-known examples in infancy is the use of **feeding cues**. For instance, a baby may initially suckle only when presented with a bottle or breast. However, over time, they may start sucking reflexively at the sight of a bib or the sound of a caregiver's voice, as these cues become associated with feeding (Sullivan & Wilson, 2018).

Another example of classical conditioning in infancy involves the development of emotional responses. If a baby repeatedly hears a loud, startling noise (unconditioned stimulus) when a certain toy is present (neutral stimulus). In that case, they may begin to associate the toy with fear (conditioned response), even if the noise is no longer present. This mechanism explains how some early fears develop and highlights the importance of creating **positive and predictable environments** for infants.

Operant Conditioning

Operant conditioning, or learning through rewards and consequences, plays a significant role in shaping the behavior of infants and toddlers. **Reinforcement** strengthens behaviors, while **punishment** reduces them (Skinner, 1953).

- **Positive Reinforcement,** such as smiling, clapping, or verbal praise, encourages infants to repeat actions. For example, if a baby babbles and a caregiver responds excitedly, the infant is more likely to continue babbling, as they associate it with positive social interaction.
- On the contrary, **negative reinforcement** focuses on removing an unpleasant stimulus to increase the likelihood of a behavior. For example, when a caregiver picks up a crying infant, the baby learns that crying results in comfort and will likely repeat the behavior when seeking attention or relief.
- While **punishment** can decrease undesirable behaviors, it is **less effective than reinforcement** in infancy. For example, an infant who touches an unsafe object and is gently redirected is more likely to learn appropriate behavior than one who is scolded, as they may not yet understand verbal discipline (Lowe et al., 2018).



Figure 12.3.1. Mom and baby are interacting. Image by Natalia Blauth on Unsplash.

Applications to Infant and Toddler Learning

Understanding these learning principles helps caregivers and early childhood professionals create **nurturing and responsive environments** that support development:

1. Establishing routines with **predictable associations** (e.g., dimming lights before bedtime to signal sleep) helps infants develop expectations and emotional security.
2. Using **positive reinforcement** (e.g., clapping when a toddler takes their first steps) encourages the development of new skills.
3. Avoiding excessive punishment and instead using **gentle guidance and redirection** fosters a safe, encouraging learning environment.

By recognizing how classical and operant conditioning shape early experiences, early childhood professionals and caregivers can better support cognitive (and emotional development) in infants and toddlers.

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 are unsure of what else to do, we learn by modeling or copying the behavior of others. A new employee, on their first day of a new job, might eagerly observe how others are acting and try to emulate their behavior 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.

Do parents socialize children, or do children socialize parents?

Bandura (1986) suggested that there is an interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. There is an interplay between our personality and the way we interpret events, as well as 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, but children also influence their parents. 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 arrives, they have very different expectations, both of themselves and their child. Our environment creates us, and we create our environment.



Figure **12.3.2**: A smiling infant playing with toys. Image by OmarMedinaFilms on Pixabay.

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SECTION OVERVIEW

12.4: Cognitive Processes

Cognitive processes are the mental activities that allow individuals to acquire, store, and use information. From infancy through adulthood, these processes shape how we perceive the world, solve problems, and interact with others. While cognition encompasses a broad range of functions, four key processes play a crucial role in development: memory, attention, executive function, and social cognition. Each will be explored more in depth in the following sub-sections.

Topic hierarchy

12.4.1: Memory

12.4.2: Attention

12.4.3: Executive Function

12.4.4: Social Cognition

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12.4.1: Memory

Learning Objectives

1. Describe the three stages of memory.
2. Differentiate between implicit and explicit memory, including the typical contexts in which each typically emerges.
3. Define and explain infantile amnesia.
4. Identify strategies caregivers and professionals can use to support memory development in infancy and toddlerhood.

Memory is a fundamental cognitive process that allows us to store, retrieve, and use information. In infancy and toddlerhood, memory development lays the foundation for learning across all domains. While long-term memory allows for lasting retention, infants must first develop the ability to encode and consolidate information. Understanding how memory functions at this stage can help us explore why infants remember some experiences while forgetting others, as well as the factors that support early memory development.

Stages of Memory

Memory progresses through different stages: sensory memory, short-term memory, and long-term memory. **Sensory memory** is the first stage and involves the brief capture of sensory information (such as sights, sounds, and textures). In infants, sensory memory is already functional at birth, allowing them to begin recognizing patterns, such as their mother's voice or the shape of a caregiver's face. However, sensory memories last only a fraction of a second unless attended to.

Short-term memory (also called working memory) is where information is temporarily held for processing. Infants have a very limited capacity for short-term memory. Research by Renée Baillargeon and others suggests that by around six months, babies can hold information in their working memory for brief periods, such as remembering the location of a hidden object. However, they need repetition and engagement to transfer this knowledge into long-term storage.

Long-term memory is the final stage, where information is stored in a more permanent manner. Unlike sensory and short-term memory, long-term memory has a much larger capacity and can last for extended periods, potentially a lifetime. However, memory development in infancy differs significantly from that of older children and adults.

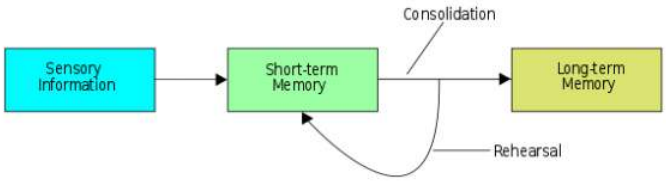


Figure 12.4.1.1: Diagram of the memory storage process. Image by Wikipedia is licensed under CC BY-SA 3.0.

Types of Long-Term Memory

Long-term memory, which has an immense capacity and can store information indefinitely, is often categorized into explicit and implicit memory. These two types of memory develop at different rates during infancy and toddlerhood.

Implicit Memory

Implicit Memory (also called procedural memory) develops first. This type of memory enables infants to recall how to perform tasks, such as sucking, grasping, and eventually crawling and walking. These skills do not require conscious recall; instead, they are built through repeated experience and become automatic. Even very young infants can retain implicit memories—for example, research has shown that two-month-old babies can remember how to kick their legs to move a mobile for up to a week after the experience (Rovee-Collier, 1999).

Explicit Memory

Explicit Memory, also known as declarative memory, takes longer to develop because it requires conscious thought. There are two types of explicit memory:

1. **Semantic memory** (knowledge of facts, such as recognizing objects or learning words) and
2. **Episodic memory** (memory of personal experiences).

Babies begin forming basic episodic memories by their first year, but these memories are fragile and can be easily forgotten. By the toddler years, explicit memory improves as children gain language skills and begin to recall past events.

While newborns can form implicit memories, explicit memory does not become well-developed until later in infancy, with significant improvement occurring around the second year of life (Rovee-Collier, 1999).

Infantile Amnesia

Despite infants' ability to form memories, most people cannot recall personal events from early childhood, a phenomenon known as **infantile amnesia** (Bauer, 2007). This occurs because the brain structures responsible for explicit memory, particularly the hippocampus and prefrontal cortex, are still developing during infancy. Without a fully mature memory system, young children struggle to encode and retrieve detailed autobiographical memories. However, research shows that while explicit memories may not last, implicit learning from infancy continues to influence later behavior.



Figure 12.4.1.2: A toddler walking. Image on Public Domain Pictures.

Supporting Memory Development with Infants and Toddlers

Although infantile amnesia prevents most early memories from lasting into adulthood, early experiences still significantly shape brain development and learning. Caregivers, educators, and other early childhood professionals can support memory development in young children by offering

- repetition and routine throughout the day (through words, songs, and actions),
- interactive play and exploration through hands on activities and responsive interactions,
- language and storytelling (specifically about past events in order to connect experiences with language), and
- emotionally meaningful experiences, as strong emotions enhance memory retention. Events that are exciting or meaningful, such as a trip to the zoo, are more likely to be remembered.

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12.4.2: Attention

Learning Objectives

1. Describe the phases of attention development during infancy and toddlerhood.
2. Define habituation and dishabituation.
3. Explain the roles of habituation and dishabituation in cognitive processing.
4. Discuss how attention development supports other domains of learning.

Attention is one of the foundational cognitive skills that emerges in infancy and continues to develop throughout early childhood. In the first two years of life, attention undergoes rapid changes, shifting from reflexive responses to more controlled and sustained focus. Understanding how infants and toddlers allocate their attention provides insight into their learning processes, information processing, and emerging self-regulation skills.

Phases of Attention Development

Research suggests that attention in infancy and toddlerhood progresses through distinct phases:

1. **Orienting (0–3 months):** Newborns primarily exhibit reflexive attention, automatically turning toward stimuli such as bright lights or sudden noises. This is driven by the brainstem and subcortical structures, which are responsible for basic survival responses.
2. **Sustained Attention (3–12 months):** Around three months, infants begin showing an increase in sustained attention. They can hold their gaze on an object for longer periods, particularly when engaged in novel or stimulating activities. During this stage, the prefrontal cortex begins to exert more influence over attention, although it remains immature.
3. **Control and Flexibility (12–24 months):** In the second year of life, toddlers develop more control over their attention. They can voluntarily shift attention between objects and activities and are starting to filter out distractions, an ability known as **selective attention.** However, the amount of time selective attention can be maintained varies from child to child and increases as they age.

Habituation and Dishabituation

A key process in early attention development is **habituation and dishabituation**—mechanisms that help infants regulate their engagement with stimuli. **Habituation** occurs when an infant's response to a repeated stimulus decreases over time, indicating that they have processed the information and no longer find it novel. This allows infants to allocate attention efficiently, focusing on new or important stimuli rather than redundant information. **Dishabituation** occurs when an infant's attention is renewed in response to a change in the stimulus, signaling that they detect something new or different. Researchers use habituation-dishabituation paradigms to study infant perception and cognitive processing, as these reactions indicate an infant's ability to recognize, compare, and categorize information in their environment.



Figure 12.4.2.1. Father is looking at his baby. Image by Helena Lopes is licensed by Pexels.

Factors that Influence

Several factors influence attention development in infancy and toddlerhood.

- **Parental interaction** plays a crucial role in shaping early attention skills. Responsive caregivers who engage in joint attention—such as following an infant's gaze, pointing out objects, or labeling items—help strengthen attentional control and support language acquisition. Infants who frequently engage in joint attention episodes tend to develop stronger cognitive and social skills.
- **Stimulus complexity** also affects attention; infants prefer stimuli that strike a balance between novelty and familiarity. If a stimulus is too simple, they lose interest quickly due to habituation, but if it is too complex, they may become overstimulated and disengage.
- **Neurological maturation** further supports attention development, as the prefrontal cortex and cognitive control networks gradually improve an infant's ability to regulate and sustain focus. However, executive control over attention remains limited in toddlerhood and continues developing throughout early childhood.

Attention as a Foundation for Learning

The ability to sustain and regulate attention is a foundational skill for early learning and development. Language acquisition is heavily dependent on attentional skills, as infants must focus on caregivers' speech patterns and gestures to learn words and meanings. Research suggests that infants who engage in frequent joint attention interactions with caregivers tend to exhibit more advanced language skills later in childhood. Memory formation also benefits from sustained attention, as infants who focus longer on objects or events are more likely to encode and retrieve that information later. Additionally, problem-solving and cognitive flexibility are supported by attentional control, as toddlers who can persistently focus on a task tend to be more successful in exploring solutions and adapting to challenges. Overall, attention in infancy and toddlerhood lays the groundwork for later executive function, self-regulation, and academic achievement, making it a key aspect of early cognitive development.

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12.4.3: Executive Function

Learning Objectives

1. Define executive function and its core components.
2. Explain how brain maturation and interactions contribute to the emergence of executive function skills in infancy and toddlerhood.
3. Identify activities and experiences that support the development of executive function in infants and toddlers.

Executive function refers to a set of cognitive processes that enable self-regulation, goal-directed behavior, and problem-solving (Diamond, 2013). While executive function skills—such as working memory, inhibitory control, and cognitive flexibility—become more advanced in later childhood, the foundations for these abilities begin to emerge in infancy and toddlerhood (Garon, Bryson, & Smith, 2008). During this period, infants begin to demonstrate basic self-regulation skills, including the ability to focus on relevant information and engage in early problem-solving behaviors, which will become more refined as their brains continue to develop.

One of the earliest signs of developing executive function is **working memory**, or the ability to hold and manipulate information over short periods. In infancy, working memory is limited but can be observed in tasks such as object permanence—the understanding that an object continues to exist even when it is out of sight (Baillargeon, 2004). Between 8 and 12 months, infants begin to successfully retrieve hidden objects, demonstrating that they can hold an image of the object in mind long enough to search for it. As toddlers grow, their working memory expands, enabling them to follow simple instructions and recall familiar routines (Gathercole et al., 2019).

Inhibitory Control and Cognitive Flexibility

Inhibitory control, or the ability to suppress impulsive responses, also begins to emerge in early development. Newborns and young infants have little ability to regulate their behaviors and often react immediately to stimuli. However, by the end of the first year, infants begin showing early signs of self-control, such as pausing before reaching for an object when signaled to wait (Hendry, Jones, & Charman, 2016). One classic task used to study inhibitory control in toddlers is the **A-not-B task**, where an object is repeatedly hidden in one location (A) before being moved to a new location (B). Younger infants often continue searching in the original location due to difficulties inhibiting a previously rewarded response; however, older infants and toddlers begin to succeed as their inhibitory control improves (Diamond, 1985).



Figure 12.4.3.1. A toddler working a shape sorter. Image by Polesie Toys is licensed by Pexels.

Another key aspect of executive function is **cognitive flexibility**, which refers to the ability to shift attention between different tasks or perspectives. While young infants tend to focus rigidly on specific stimuli, by the second year of life, toddlers begin to demonstrate greater flexibility in problem-solving and adapting to new situations (Kirkham, Cruess, & Diamond, 2003). For example, a toddler who initially tries to fit a toy through a small opening may adjust their approach by rotating it or selecting a different entry point. This growing adaptability reflects the early development of cognitive flexibility, which will continue expanding through play, exploration, and caregiver interactions.

Influences on Executive Function

The development of executive function in infancy and toddlerhood is shaped by both biological maturation and environmental experiences. The prefrontal cortex, which is responsible for higher-order thinking and self-regulation, undergoes rapid growth during this time (Nelson, Thomas, & De Haan, 2006). However, because these brain regions are still developing, infants and toddlers rely heavily on external support from caregivers to regulate their behaviors and emotions. Responsive parenting—such as providing structure, modeling self-control, and guiding problem-solving efforts—helps strengthen emerging executive function skills (Bernier, Carlson, & Whipple, 2010). Activities like **serve-and-return interactions**, in which caregivers and infants engage in back-and-forth exchanges (e.g., responding to babbling, taking turns in simple games), support the development of working memory and attention regulation (Center on the Developing Child, 2011). Additionally, play-based experiences, such as sorting objects, following simple rules, or engaging in pretend play, provide natural opportunities for toddlers to practice executive function skills (Carlson, White, & Davis-Unger, 2014).

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12.4.4: Social Cognition

Learning Objectives

1. Define social cognition and describe its development in infancy and toddlerhood.
2. Identify the biological and social factors that influence the development of early social-cognitive skills.

Social Cognition in Infants and Toddlers

Social cognition refers to the ability to perceive, interpret, and respond to social interactions, laying the foundation for later language and social-emotional development (Meltzoff & Marshall, 2018). In infancy and toddlerhood, children begin developing an understanding of people as intentional agents. This early awareness is shaped through interactions with caregivers and social partners, as well as infants' growing ability to recognize and predict others' behaviors.

One of the earliest markers of social cognition is face perception, which emerges in the first months of life. Infants are biologically attuned to human faces and show a preference for looking at faces over other visual stimuli (Johnson et al., 2015). By around 6 months, they can distinguish between familiar and unfamiliar faces and begin to exhibit social referencing—looking to caregivers for cues about how to react in uncertain situations (Walden & Ogan, 1988). For example, an infant who encounters a new toy may glance at a caregiver's expression; if the caregiver smiles, the infant is more likely to engage with the toy, whereas a fearful expression may lead the infant to withdraw.

Joint Attention

Another key development in social cognition is **joint attention**, which refers to the ability to share attention with another person toward an object or event. Joint attention typically emerges between 9 and 12 months and is a crucial precursor to language and social learning (Tomasello, 2019). When a caregiver points at an object and an infant follows their gaze, they are demonstrating an early understanding that others have perspectives and intentions that can be shared. This ability to coordinate attention with others enhances learning opportunities and strengthens social bonds.

Theory of Mind

By the toddler years, children begin to develop a **theory of mind**, which is the understanding that others have thoughts and emotions that may differ from their own. While a full theory of mind does not emerge until later in childhood, toddlers exhibit early forms of this ability through behaviors such as pretend play and empathy (Wellman, 2014). For example, a toddler who sees a peer crying may attempt to comfort them by offering a toy, showing an emerging awareness of others' emotions. Additionally, toddlers begin engaging in **imitative learning**, where they observe and replicate the actions of caregivers and peers, often in a socially meaningful manner (Meltzoff, 2007). This capacity for imitation supports both cognitive and social development, as it enables young children to acquire new skills, cultural practices, and behavioral norms.



Figure 12.4.4.1. Infants and toddlers often imitate what they see others doing, especially in socially meaningful ways. Image by mliu92 is licensed CC BY-SA 2.0.

Influences on Social Cognition

Both biological factors and social experiences influence the early development of social cognition. The brain regions associated with social processing, such as the prefrontal cortex and the superior temporal sulcus, undergo significant growth during infancy and toddlerhood (Grossmann, 2015). However, social interactions play a critical role in shaping these cognitive abilities. Responsive caregiving, conversational turn-taking, and exposure to diverse social experiences help refine infants' understanding of social cues and intentions (Shimpi & Huttenlocher, 2007). Furthermore, children who experience rich social environments, including secure attachment relationships and opportunities for peer interaction, tend to develop stronger social-cognitive skills (Meins et al., 2013).

By the end of toddlerhood, children have built a foundation for interpreting emotions, engaging in reciprocal interactions, and understanding basic social norms. These early social-cognitive abilities serve as critical building blocks for later relationships.

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12.5: 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 12.5.1: Cognitive Milestones. Developmental Milestones by the CDC is in the public domain.

https://socialsci.libretexts.org/@go/page/225484

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

Typical Age	What Most Children Do by This Age
	• Might use one hand more than the other • Follows two-step instructions such as “Pick up your shoes and put them in the closet.” • Names items in a picture book, such as a cat, bird, or dog

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12.6: Differences in Cognitive Abilities

Learning Objectives

1. Describe how biological, environmental, and experiential factors contribute to overall cognitive differences in infants and toddlers.
2. Explain the importance of assessing cognitive abilities in infancy and toddlerhood to identify typical and atypical development.

Individual differences in cognitive abilities during infancy and toddlerhood arise from a combination of biological factors, early experiences, and environmental influences. Genetic variation, differences in brain maturation, and temperament influence the emergence of cognitive skills. At the same time, caregiver interactions, cultural expectations, and opportunities for exploration further contribute to developmental variability (Bauer, 2013; Colombo & Cheatham, 2006).

Assessing these differences early is crucial for identifying both typical developmental trajectories and potential delays. Researchers and practitioners use a variety of assessments —observational methods, structured tasks, and neurophysiological methods —to measure and track cognitive progress. For instance, habituation tasks help assess information processing efficiency, while early attention span is linked to later learning outcomes (Colombo, 2001). Identifying delays in areas such as memory, attention, or self-regulation enables early intervention, which is crucial for supporting later academic and social success (Cuevas & Bell, 2014).

By understanding individual differences and refining assessment tools, caregivers and professionals can better tailor learning environments and support strategies, ensuring that each child's cognitive potential is maximized from the start.

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12.7: Language Development

Do newborns communicate? Absolutely! However, they do not communicate through 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 to distinguish between cries that indicate pain and those that indicate hunger, discomfort, or frustration, as well as interpret their vocalizations, movements, gestures, and facial expressions.



Figure **12.7.1**: An infant looking up at the camera. Image by Heather Carter is licensed CC BY-NC-ND 4.0.

Theories of Language Development

How do babies and toddlers learn to understand and use language? Researchers have different ideas about how this process happens. Some believe language is something we're born ready to learn, while others think it develops through interaction and experience. A few key theories help explain how young children acquire language: Noam Chomsky's idea of the Language Acquisition Device (LAD), the nativist perspective, interactionism, and statistical learning.

Chomsky and the Language Acquisition Device

Linguist Noam Chomsky (1957, 1965) argued that humans are naturally wired to learn language. He suggested that babies are born with a **Language Acquisition Device (LAD)**—an innate mental system that helps them acquire grammar and structure without needing explicit instruction. This helps explain why children can put sentences together in new ways they've never heard before. Even with limited exposure to language, children appear to absorb its rules and patterns quickly.



Figure **12.7.2**. Noam Chomsky (1977). Image is licensed CC0 1.0.

Nativism

Chomsky's theory is part of a larger concept known as **nativism**, which posits that the ability to learn language is largely innate to the brain (Pinker, 1994). Evidence for this comes from research on **critical periods**—specific windows of time when learning language is easiest (Lenneberg, 1967). For example, children who aren't exposed to language early in life may struggle to develop their language skills fully later on. Nativists believe that while experience is important, the brain is already set up to acquire language from birth.

Interactionism

While nativists focus on what is already in the brain, **interactionist** theories highlight the role of social interactions in language learning. This perspective suggests that babies learn language by engaging with the people around them—listening to speech,

responding to gestures, and participating in conversations (Vygotsky, 1978; Bruner, 1983). Caregivers play a significant role by engaging with children, asking questions, and encouraging their responses. Research shows that children raised in language-rich environments tend to develop stronger vocabulary and communication skills (Hoff, 2006).

Statistical Learning

Another way infants and toddlers learn language is through **statistical learning**, or picking up patterns in the speech they hear. Even before they understand words, infants can track which sounds frequently occur together and use that to figure out word boundaries (Saffran et al., 1996). This means that while children may be naturally prepared to learn language, they also rely heavily on experience and exposure to spoken words. Statistical learning helps explain how babies absorb a great deal of language information without formal instruction. This is similar to the 'predict-a-text' feature on a phone. If you were to start typing a text to a friend, your phone would auto-generate words as soon as you type in a letter based on common words starting with that letter, as well as words you use frequently that start with the letter. This is a type of statistical learning for the AI that powers many devices.

Language and the Brain

Two key areas in the brain work together to support language: **Broca's area**, located in the left frontal lobe, and **Wernicke's area**, found in the left temporal lobe. Broca's area is responsible for speech production and grammatical structure (Broca, 1861), while Wernicke's area is essential for language comprehension (Wernicke, 1874).

When infants begin recognizing familiar words, Wernicke's area processes their meaning. As toddlers start forming sentences, Broca's area helps them structure speech correctly. The two areas communicate through the **arcuate fasciculus**, a bundle of nerve fibers that allows for smooth back-and-forth processing between understanding and speaking.

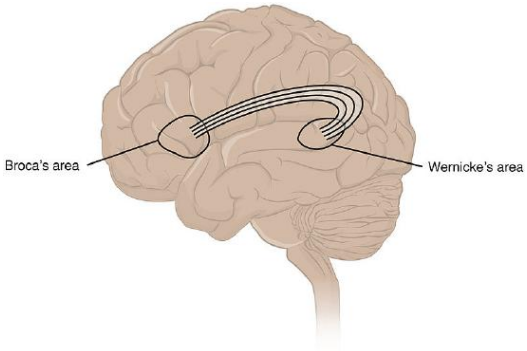


Figure 12.7.3. Broca's and Wernicke's areas are connected via the arcuate fasciculus. Image is licensed CC BY 3.0.

Damage to Broca's area can result in **Broca's aphasia**, where a person struggles to form complete sentences but still understands speech. In contrast, damage to Wernicke's area can cause **Wernicke's aphasia**, where speech remains fluent but lacks meaningful content. This distinction highlights the specialized roles these areas play in language learning and use.

During infancy and toddlerhood, the brain rapidly strengthens these language connections, allowing children to go from recognizing words to forming meaningful sentences. Understanding how these regions develop provides insight into early language acquisition and potential delays.

Aspects of Language

Language development in early childhood is a complex process that involves mastering five key aspects: phonology, morphology, syntax, semantics, and pragmatics. These components work together to help young children acquire and use language effectively.

1. **Phonology** refers to the sound system of a language, including the rules for combining sounds. In early childhood, infants begin by recognizing speech sounds (phonemes) and gradually learn to produce them. Babbling transitions into recognizable words as children refine their articulation and develop phonemic awareness, a skill essential for later reading development (Kuhl, 2004).
2. **Morphology** is the study of word formation and structure, including prefixes, suffixes, and root words. As toddlers expand their vocabulary, they begin applying morphological rules, such as adding "-s" to form plurals or "-ed" to indicate

the past tense. Overgeneralization errors, like "goed" instead of "went," reflect their active learning of these rules (Berko, 1958).

3. **Syntax** involves the rules governing sentence structure and word order. Young children gradually learn to form grammatically correct sentences, progressing from simple two-word phrases ("want cookie") to more complex sentences by age three. This syntactic development is influenced by caregiver interactions and the amount of language exposure in the child's environment (Hirsh-Pasek & Golinkoff, 1996).
4. **Semantics** refers to the meaning of words and phrases, as well as the structure of sentences. Vocabulary growth is a critical milestone in early childhood, as children learn to connect words with concepts. The rapid increase in vocabulary, known as the "vocabulary explosion," typically occurs between 18 and 24 months (Bloom, 2000). A child's ability to understand and use words meaningfully supports their later literacy and cognitive development.
5. **Pragmatics** is the social aspect of language, involving conversational rules, turn-taking, and understanding nonverbal cues. Toddlers and preschoolers refine these skills through social interactions, learning how to adjust their speech based on context and audience. Pragmatic development is crucial for effective communication and social competence (Tomasello, 2003).

Stages of Language Development

Prenatal Foundations

Language development begins before birth as the fetus becomes attuned to the sounds of its environment. Around the **third trimester**, the auditory system is developed enough for the baby to hear and respond to external sounds, particularly the mother's voice and the rhythmic patterns of speech (DeCasper & Fifer, 1980). Research indicates that newborns recognize and prefer the language spoken by their mother during pregnancy, suggesting that they engage in early auditory learning (Kuhl, 2004). Additionally, fetuses can detect prosody—the melody and rhythm of speech, which helps lay the groundwork for distinguishing different speech sounds after birth. This early exposure to language sounds primes infants for later language learning, making the prenatal period a crucial stage in the foundations of communication.

Stage 1: Preverbal Communication

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 for an infant who has been laid down for a nap or seated in a carrier on a car ride. Coos serve as practice for vocalization, as the infant hears the sound of their voice and tries to repeat sounds that are entertaining. Infants also begin to learn the pace and pauses of conversation as they alternate their vocalizations with those of someone else and then take their turn again when the other person's vocalization has stopped. Cooing initially involves making vowel sounds, such as "oooo". Later, consonants are added to vocalizations such as "nanananananana".

Stage 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 are ready to equip the child with the ability to repeat the sounds characteristic of the language being 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 their ability to communicate by leveraging the ease of gesturing. The rhythm and pattern of language are used when deaf babies sign, just as it is when hearing babies babble.



Figure 12.7.4. Infants' first sounds are in the form of babbling, accompanied by gestures such as hand movements and various facial expressions. Image by Heather Carter is licensed CC BY-NC-ND 4.0.

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 contribute to it.

Stage 3: First Words (Holophrastic)

Children typically begin using their first words at around 12 or 13 months of age and may use partial words to convey their 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 of juice. 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 understanding 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."

First words, if the child is using English, tend to be nouns. The child labels objects such as a cup or a ball. In a verb-friendly language such as Chinese, however, children may learn more verbs. This may also be due to the varying emphasis placed on objects based on cultural context. Chinese children may be taught to notice the action and relationship between objects, while children from the United States may be taught to name an object and its qualities (such as color, texture, and size). These differences are evident when comparing the interpretations of art by older students from China and the United States.



Figure 12.7.5: Two children playing with toys. Image by the U.S. Air Force is in the public domain.

A child who learns that a word represents an object may initially think that the word can be used only for 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.

Stage 4: Two-Word (Telegraphic)

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).

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

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,** also referred to as **parentese (**historically known as **motherese)**. It involves exaggerating the vowel and consonant sounds, using a high-pitched voice, and delivering the phrase with great facial expression. Why is this done? It may be in order to clearly articulate the sounds of a word so that the child can hear the sounds involved. Or it may be because when this type of speech is used, the infant pays more attention to the speaker, and this sets up a pattern of interaction in which the speaker and listener are in tune with one another. [12]

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12.8: Language Milestones

Language Milestones

In the first two years of life, children transition from communicating primarily through crying to expressing themselves with words. Here is a table of common language milestones for infants and toddlers.

Table 12.8.1: Language Milestones (Developmental Milestones by the CDC is in the public domain)

Typical Age	What Most Children Do By This Age
2 months	• Coos, makes gurgling sounds • Turns head toward sounds
4 months	• Begins to babble • Babbles with expression and copies sounds he hears • Cries in different ways to show hunger, pain, or being tired
6 months	• Responds to sounds by making sounds • Strings vowels together when babbling (“ah,” “eh,” “oh”) and likes taking turns with parent while making sounds • Responds to own name • Makes sounds to show joy and displeasure • Begins to say consonant sounds (jabbering with “m,” “b”)
9 months	• Understands “no” • Makes a lot of different sounds like “mamamama” and “bababababa” • Copies sounds and gestures of others • Uses fingers to point at things
1 year	• Responds to simple spoken requests • Uses simple gestures, like shaking head “no” or waving “bye-bye” • Makes sounds with changes in tone (sounds more like speech) • Says “mama” and “dada” and exclamations like “uh-oh!” • Tries to say words you say
18 months	• Says several single words • Says and shakes head now • Points to show others what is wanted
2 years	• Points to things or pictures when they are named • Knows names of familiar people and body parts • Says sentences with 2 to 4 words • Follows simple instructions • Repeats words overheard in conversation • Points to things in a book

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12.9: Promoting Cognitive and Lanugage Development

Learning Objectives

1. Explain how everyday caregiver-child interactions promote cognitive and language development in infants and toddlers.
2. Describe specific strategies that support early learning.
3. Discuss the importance of following a child's interests and engaging in responsive, reciprocal communication.

Caregivers and early childhood professionals play a crucial role in promoting cognitive and language development in infants and toddlers. Simple, everyday interactions provide meaningful learning experiences that help build both cognitive and language skills.

Talk Often and Respond to Sounds

Infants begin learning language long before they speak their first words. Talking to babies throughout the day—describing what you're doing, naming objects, and responding to their coos and babbles—helps them recognize speech patterns and associate words with meanings. **Serve-and-return interactions**, where caregivers respond warmly to an infant's sounds and facial expressions, strengthen brain connections for communication (Shonkoff & Phillips, 2000).

Use Parentese, Gestures, and ASL

Speaking in **parentese**—a higher-pitched, slow, and exaggerated style of speech—captures infants' attention and helps them process language (Kuhl et al., 1997). Simple gestures, such as waving, clapping, and pointing, help babies communicate before they can speak and support the development of early vocabulary. Using **American Sign Language (ASL)** for basic words like "more," "all done," "eat," or "milk" can be a valuable tool for early communication and language development. Research suggests that introducing simple signs alongside spoken words helps infants express needs before they can verbalize them, reducing frustration and encouraging early language development (Goodwyn et al., 2000). Parents and caregivers can start by identifying a few key signs and naturally incorporate them into daily interactions, ensuring they always accompany the spoken word with the sign to reinforce verbal development.



Figure 12.9.1. Mother and daughter are waving. Image by Nikita Nikitin is licensed by Pexels.

Reading Daily

Even before infants understand words, they benefit from being read to. Books featuring high-contrast images, simple rhymes, and repetitive phrases effectively engage young learners and foster early literacy skills. As toddlers grow, pointing to pictures, naming objects, and encouraging them to turn pages make reading an interactive experience. Books with real-life images and familiar objects help connect words to their world.



Figure 12.9.2. Reading books with real images and environmental sounds helps infants and toddlers to more easily make connections to the real world. Image by Heather Carter is licensed CC BY-NC-ND 4.0.

Songs and Sounds

Singing songs, reciting nursery rhymes, and playing with different sounds introduce infants to the rhythm and melody of language. Simple games like pat-a-cake and peekaboo encourage back-and-forth interaction, helping babies develop communication and memory skills. Toddlers enjoy action songs, like "Itsy Bitsy Spider," which pair movement with language learning.

Exploration and Sensory Play

Infants and toddlers learn by experiencing the world through their senses. Providing safe opportunities to touch, grasp, shake, and explore different textures helps develop problem-solving and fine motor skills. Simple activities, such as feeling soft fabric, playing with water, or stacking blocks, support cognitive growth. Talking about what they see, hear, and feel helps connect sensory experiences to language.



Figure 12.9.3. Sensory play "making sushi" with bubble wrap, felt pieces, and large fuzzy pipe cleaners in a toddler classroom. Image by Heather Carter is licensed CC BY SA 4.0

Following Interests and Expanding on Their Words

Paying attention to what a child looks at, points to, or vocalizes allows caregivers to build on their curiosity. If a toddler says "dog," responding with "Yes, that's a big, fluffy dog!" expands their vocabulary naturally. **Recasting**, or repeating what a child says in a more complex way, helps with grammar and language development without directly correcting them.

Simple Social Play

Face-to-face interactions, such as making silly faces, playing peekaboo, or rolling a ball back and forth, support early social and cognitive skills. Older infants and toddlers begin to enjoy parallel play, where they play alongside others, and simple turn-taking games. Encouraging interactions with siblings, caregivers, and other children provides rich language experiences.

By incorporating these simple strategies into daily routines, parents and caregivers create a strong foundation for infants' and toddlers' cognitive and language development, setting the stage for lifelong learning.

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CHAPTER OVERVIEW

13: Social and Emotional Development in Infancy and Toddlerhood

While temperament is determined by genetics and emotions develop through maturation, the early interactions we have with the adults who 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.

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13.1: Infant Emotions

Learning Objectives

1. Differentiate between basic (primary) and self-conscious (secondary) emotions and identify when each typically emerges.
2. Describe how infants express and interpret emotions.
3. Explain how emotional self-regulation develops during infancy and toddlerhood and identify factors that influence it.
4. Compare emotional coaching and emotional dismissing approaches and their impact on children's emotional development.
5. Identify practical strategies caregivers can use to support emotional self-regulation in infants and toddlers.

What are Emotions?

Emotions are a reaction to an experience or situation. Emotions are often divided into two general categories:

1. **Basic emotions** (primary emotions), such as interest, happiness, anger, fear, surprise, sadness, and disgust, which appear first, and
2. **Self-conscious emotions** (secondary emotions), such as envy, pride, shame, guilt, doubt, and embarrassment.

Basic, or primary emotions, are those that are innate- we are born with them. Secondary emotions emerge as children develop a self-concept and require social guidance on when to express such emotions. The situations in which children learn self-conscious emotions vary across cultures. Individualistic cultures teach us to take pride in personal accomplishments. In contrast, in more collectivist cultures, children are taught not to draw attention to themselves, unless they wish to avoid embarrassment for doing so (Akimoto & Sanbinmatsu, 1999).



Figure 13.1.1: An infant making an angry facial expression. Image by Brytny.com on Unsplash.

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, responding with smiles to those who capture 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 achieving a goal, such as when a toy is 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).

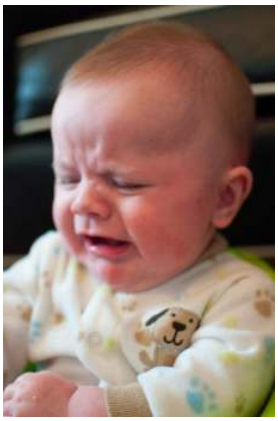


Figure 13.1.2: An infant making a sad facial expression. Image by acheron0 is licensed under CC BY 2.0.

Connecting with Others' Emotions

Facial expressions of emotion are essential regulators of social interaction. In the developmental literature, this concept has been investigated under the concept of **social referencing,** which 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 at 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 various 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 they saw disgust.

Developing Emotional Self-Regulation

A final emotional change is in self-regulation. **Emotional self-regulation** refers to the strategies we use to control our emotional states, enabling us to attain our goals (Thompson & Goodvin, 2007). This requires effortful control of emotions and initially requires assistance from caregivers (Rothbart, Posner, & Kieras, 2006). Young infants have a 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 communicate their needs for help more effectively 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 13.1.3: A toddler at a park. Image is licensed under CC0.

Emotional Coaching vs. Dismissing

Gottman et al. (1996) identified two primary approaches caregivers use when responding to children's emotions: emotional coaching and emotional dismissing.

1. **Emotional coaching** involves recognizing, validating, and labeling children's emotions while guiding them toward appropriate regulation strategies. Caregivers who use this approach help children understand their feelings and develop problem-solving skills. For example, a caregiver might say, "I see that you're feeling frustrated because your tower fell. That can be really upsetting. Let's take a deep breath and try again together." This method promotes emotional intelligence and resilience, enabling children to develop more effective coping mechanisms (Rothbart et al., 2006).
2. **Emotional dismissing** occurs when caregivers minimize, ignore, or discourage the expression of emotions. Common phrases associated with this approach include "Don't be sad," "You're fine," or "Stop crying." This response can lead children to feel misunderstood, suppress their emotions, and struggle with self-regulation in later years (Gottman et al., 1996). Research suggests that children raised by emotionally dismissive caregivers may have more difficulty managing stress and understanding their emotions (Cole et al., 2010).

Practical Strategies for Supporting Emotional Self-Regulation

Parents and caregivers can implement several practical strategies to help young children develop emotional self-regulation.

- Modeling self-regulation is one effective approach, as children learn by observing how caregivers manage their own emotions. Demonstrating calm responses to stress and verbalizing coping strategies can help children learn to manage their own emotions constructively (Kopp, 2011).
- Providing predictable routines is another key strategy, as consistent daily schedules help infants and toddlers feel secure, reducing emotional distress and promoting self-regulation (Rothbart & Bates, 2006).
- Comforting techniques, such as physical touch, holding, or rocking, help infants regulate distress, while toddlers may benefit from deep-breathing exercises or comfort objects like a favorite blanket (Braungart-Rieker et al., 2010).
- Encouraging emotional expression by acknowledging and labeling feelings can enhance a child's ability to regulate emotions effectively (Cole et al., 2010).
- Additionally, scaffolding problem-solving skills—such as guiding toddlers through frustration by helping them find alternative solutions—fosters problem-solving abilities and emotional resilience (Lavelli & Fogel, 2005).

By adopting these strategies, caregivers can create an emotionally supportive environment that nurtures the development of self-regulation in young children, setting the foundation for future emotional well-being and social competence.

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13.2: Temperament

Learning Objectives

1. Define temperament.
2. Summarize Chess and Thomas's three types of temperament and the dimensions used to classify them.
3. Explain the concept of goodness-of-fit and how it influences caregiver-child interactions.

Perhaps you have spent time with several 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 refers to the innate characteristics of an infant, including mood, activity level, and emotional reactivity, which are noticeable soon after birth.

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

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

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

Table **13.2.1**: Types of Temperament

Type	Percentage	Description
Easy	**40%**	• Able to quickly adapt to routine and new situations • Remains calm • Easy to soothe • Usually positive in 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 could not be placed neatly into one of the categories. Consider how each type of child should be approached to enhance 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 extra time to expend their energy.

Goodness of Fit

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



Figure **13.2.1**: This adventurous child's parents provide a good "fit" to her temperament. Image is licensed under CC0 1.0.

Parenting is Bidirectional

Not only do parents affect their children, but children also 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 their parents and may result in parents feeling less effective in their 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 or difficult child are less satisfied with their marriages and face greater challenges in balancing work and family roles (Hyde, Else-Quest, & Goldsmith, 2004). Thus, child temperament is one of the child characteristics that influences how parents behave with their children.

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13.3: Personality

Learning Objectives

1. Differentiate between temperament and personality.
2. Explain how temperament contributes to personality development.
3. Describe how biological maturation and early caregiving experiences shape personality traits over time.
4. Explain how cultural norms influence the development and expression of personality traits.
5. Examine the influence of gender norms on personality development and trait expression across various cultures and historical periods.

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 aspects of ourselves that remains constant 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 composed of many other features beyond 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 in 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 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 essential influence on traits, defining common traits as those that are recognized within a particular 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 13.3.1: A family from a non-Western culture. Image by Theodor Goutas on Unsplash.

Considering cultural influences on personality is important because Western ideas and theories are not necessarily applicable to other cultures (Benet-Martinez & Oishi, 2008). There is considerable evidence that the strength of personality traits varies across cultures, and this is particularly evident when comparing individualist cultures (such as those found in Europe, North America, and

Australia) with collectivist cultures (such as those found in Asia, Africa, and South America). **Individualist cultures** tend to emphasize the importance of independence, competition, and personal achievement. In contrast, people who live in **collectivist cultures** tend to value social harmony, respect, and the needs of the group over individual needs. These values influence personality in different but substantial ways; for example, Yang (2006) found that individuals in individualist cultures displayed more personally oriented personality traits, whereas those 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 **13.3.2**: A female infant wearing stereotypically feminine clothing and accessories. Image by Abdullah Shakoor on Pixabay.



Figure **13.3.3**: A male infant wearing stereotypically masculine clothing. Image is licensed under CC0 1.0.

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

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13.4: Development of the Self

Learning Objectives

1. Describe the early development of self-awareness.
2. Explain the significance of mirror self-recognition and its cultural variability.
3. Identify how toddlers demonstrate emerging self-concept through language use and perspective-taking.
4. Discuss the role of possessiveness and autonomy in toddler self-development.

The Self

The development of self-awareness begins early in infancy, first emerging as a sense of agency—the understanding that one's actions can produce effects in the environment. Research suggests that by two to three months of age, infants demonstrate intentional actions, such as kicking to move a mobile or reaching for objects (Rochat, 2003). This early awareness of control over their surroundings lays the foundation for later self-recognition and emotional regulation. As infants grow, their increasing ability to coordinate their movements and recognize patterns in caregivers' responses contributes to the development of a sense of self. By around 18 to 24 months, many toddlers show clear signs of self-recognition, such as identifying themselves in mirrors and photographs (Lewis & Brooks-Gunn, 1979). This growing self-awareness influences how they express emotions, assert independence, and engage in social interactions.

Mirror Self-Recognition

Infants begin to show signs of self-awareness around 18 months, with mirror self-recognition being a major indicator. When babies first look into a mirror, they may show little to no recognition of themselves. However, between 18 and 24 months, many infants start to understand that the reflection in the mirror is "me." This cognitive shift marks a significant developmental milestone and is closely tied to the child's growing sense of individuality (Amsterdam, 1972). Mirror self-recognition is closely tied to other aspects of self-awareness, including the ability to understand that one's body is distinct from others and the environment around them (Lewis & Brooks-Gunn, 1979).



Figure 13.4.1. A young girl interacts with her reflection in the mirror. Image by Melbin Jacob is licensed by Pexels.

As toddlers approach their second birthday, their sense of bodily self-awareness deepens. However, this development is not universal. Cultural factors play a significant role in shaping how children recognize and interact with their own bodies. For instance, in individualistic societies, where independence is highly valued, children may exhibit self-recognition and a desire for autonomy at an earlier age. In contrast, in collectivist societies, where interdependence is emphasized, children may take longer to develop these self-focused behaviors (Rothbaum et. al, 2000). Cultural differences, then, influence not only the timing of self-recognition but also how it is expressed.

Use of Pronouns

In the toddler years, children also begin using pronouns like "I" and "me" to refer to themselves. This linguistic milestone is another sign of their developing self-concept. The use of pronouns is closely linked to the child's growing understanding that they

are a separate entity, capable of having their own thoughts and feelings (Nelson, 1996). This language development signals a significant shift in the toddler's sense of self.

Perspective Taking

Another developmental milestone in toddlerhood is the ability to understand that others can see things from different viewpoints, known as visual perspective-taking. By around two years old, toddlers begin to grasp that others may have different thoughts, feelings, and perceptions from their own. This skill is crucial for empathy and social interaction (Flavell, 1999). Perspective-taking is foundational to understanding social dynamics, which will continue to evolve as children grow.

Possessiveness

A common and sometimes challenging behavior in toddlers is possessiveness. At this age, children begin to understand the concept of ownership, often saying things like "mine" to assert their rights over toys or other objects. This behavior is a normal part of development, though it can sometimes create conflict in group settings. Possessiveness is also linked to Erik Erikson's theory of psychosocial development, specifically the stage of autonomy versus shame and doubt. As toddlers explore their world and begin asserting their independence, they can experience feelings of pride when their desires and needs are met, or feelings of shame and doubt when they are thwarted. This dynamic is crucial for building self-esteem and confidence (Erikson, 1963).

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SECTION OVERVIEW

13.5: Attachment

Learning Objectives

1. Define attachment and explain its role in infant development.
2. Describe the characteristics of a secure attachment and how it is formed.

Attachment in infancy refers to the emotional bond that develops between an infant and their primary caregiver(s), which serves as the foundation for the child's social and emotional development. This bond is critical because it provides the infant with a sense of security and comfort, especially in times of stress or uncertainty. **Secure attachment** forms when a caregiver consistently responds to the infant's physical, emotional, and social needs, creating a safe and reliable environment (Ainsworth, 1979). Although mothers are typically seen as the primary attachment figures, infants can also develop secure attachments to other caregivers, such as fathers, grandparents, or non-parental caregivers, as long as these relationships are characterized by warmth, responsiveness, and consistency (Bowlby, 1969). These early attachments play a crucial role in the child's ability to form healthy relationships throughout life and contribute to overall emotional well-being (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000).



Figure 13.5.1. The formation of attachment in action as a father snuggles newborn twins. Image by Jamie Smed is licensed CC BY-ND 2.0.

As previously discussed, Erikson agreed 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).

Topic hierarchy

13.5.1: Early Research on Attachment

13.5.2: Bowlby's Attachment Theory

13.5.3: Attachment Security

13.5.4: Attachment as Related to Biology and Culture

13.5.5: Attachment Disorders

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13.5.1: Early Research on Attachment

Learning Objectives

1. Summarize Freud's psychoanalytic explanation of infant attachment.
2. Explain Harlow's research findings and how they challenged earlier beliefs about attachment.
3. Define contact comfort and describe its role in the formation of attachment.

Freud's Psychoanalytic Theory

According to Freud (1938) infants are oral creatures who obtain pleasure from sucking and mouthing objects. Freud believed the infant would 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

Until Harlow published his research on attachment, the scientific community generally agreed with Freud that nourishment was the primary reason infants attached to their mothers. In the 1950s, Wisconsin University psychologists Harry and Margaret Harlow investigated the responses of young rhesus monkeys to explore whether breastfeeding was the most important factor in attachment. 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.



Figure 13.5.1.1: Infant monkey clinging to cloth mother surrogate. Image by Psych Net is licensed under CC 0.

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 both social and 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.

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13.5.2: Bowlby's Attachment Theory

Learning Objectives

1. Define attachment according to Bowlby and explain its importance for emotional and social development.
2. Describe the concept of a secure base and its role in healthy attachment.
3. Identify and explain Bowlby's four stages of attachment development.

Bowlby's Theory

Building on the work of Harlow and others, John Bowlby developed the concept of attachment theory. He defined attachment as the affectional bond or tie that an infant forms with the mother (Bowlby, 1969). An infant must form this bond with a primary caregiver in order to have normal social and emotional development. In addition, Bowlby proposed that this attachment bond is very powerful and continues throughout life. He used the concept of a secure base to define a healthy attachment between parent and child (Bowlby, 1982). A **secure base** is a parental presence that provides the child with a sense of safety as they explore their surroundings.



Figure 13.5.2.1: A mother offering a secure base as her infant plays on a slide. Image is licensed under CC0.

Bowlby stated that two key elements are necessary 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.

Bowlby's Stages of Attachment

Bowlby proposed that attachment develops in stages, each of which plays a crucial role in the child's emotional and social development. The stages outline how infants gradually build trust and security with their caregivers, shaping their ability to engage with the world around them.

Pre-Attachment (0-6 weeks)

The first stage occurs from birth to approximately six weeks, during which infants show little to no specific attachment to any particular caregiver. At this stage, infants are primarily focused on their own survival needs and respond to comfort from any available caregiver. Infants will cry to signal distress, seek physical closeness, and maintain eye contact, but there is no preference for a specific individual (Bowlby, 1969). This is the period of building the foundations for later attachment.

Attachment in the making (6 weeks to 6-8 months)

Around six weeks, infants begin to develop a preference for familiar caregivers. During this stage, infants start to recognize and distinguish between caregivers, showing signs of attachment, such as smiling or cooing at familiar faces. However, they are not yet fully distressed by separation from their primary caregiver. At this point, infants are still building trust and predictability in their relationships (Bowlby, 1969).



Figure 13.5.2.2: This child is seeking comfort from an attachment figure. Image hosted by Pixabay is licensed CC0 1.0.

Clear-cut attachment (6-8 months to 18-24 months)

The clear-cut attachment phase is marked by strong emotional attachment to primary caregivers. This is when separation anxiety begins to emerge, as infants start to show distress when separated from their attachment figures. The attachment figure becomes a secure base for exploration, meaning that the infant uses the caregiver as a source of comfort when distressed, while also seeking to explore their environment, with the caregiver's presence providing reassurance (Bowlby, 1969). Attachment behaviors, such as clinging and seeking proximity, become more evident.

Reciprocal relationships (18-24 months and on)

In the final stage, the infant begins to understand the caregiver's needs and feelings. This period is characterized by an increasing ability to form more sophisticated relationships, as children start to communicate their needs and desires more effectively. As toddlers develop cognitive and social skills, they begin to understand that caregivers may need to leave and return, and that separations are temporary. At this stage, attachment is not only about security but also about mutual understanding and the beginning of social cooperation (Bowlby, 1969).

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13.5.3: Attachment Security

Learning Objectives

1. Describe the Strange Situation procedure and its role in assessing attachment styles in infancy.
2. Identify and compare the four types of attachment based on infant responses to separation and reunion.
3. Discuss the distribution of attachment styles in U.S. children and the cultural considerations in attachment assessment.
4. Explain the concept of continuity of care.

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 developed a laboratory test that measured an infant's attachment to their 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 their parent (Ainsworth, 1979).



Figure 13.5.3.1: An infant crawling on the floor with toys around as done in the Strange Situation. Image by Petr Kratochvil is in the public domain.

During the procedure, which lasts approximately 20 minutes, the parent and the infant are first left alone while the infant explores the room filled with toys. Then a strange adult enters the room and talks to the parent for a minute, 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." Based on their behaviors, the children are categorized into one of four groups, each reflecting a different kind of attachment relationship with the caregiver. One style is secure, and the other three styles are referred to as insecure.

Table 13.5.3.1. Types of Attachment by Behaviors

Attachment Style	Behavior During Caregiver's Presence	Behavior During Caregiver's Departure	Behavior Upon Caregiver's Return
Secure	Explores freely, may engage with the stranger, plays with toys, and occasionally brings toys to the caregiver to show and describe.	May become upset, but recovers after the caregiver's departure.	Happy to see the caregiver return, seeks comfort and reassurance.
Ambivalent (Resistant)	Wary, stays close or clings to the caregiver, avoids exploring toys.	Extremely distressed, may cry and show anxiety.	Ambivalent reaction, rushes to the caregiver but may resist comfort, remains angry or upset.
Avoidant	Avoids or ignores the caregiver, shows little emotion, and does not explore much.	Shows little emotion, does not seem distressed.	Ignores or avoids the caregiver, shows no emotional reaction.
Disorganized/Disoriented	Inconsistent, may seem confused or fearful, may alternate between seeking closeness and avoiding the caregiver.	May cry during the separation, but shows confusion.	May avoid the caregiver upon return or show contradictory behaviors (e.g., approaching but freezing or falling).

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.

Keep in mind that methods for measuring attachment styles have been based on a model that reflects middle-class, U.S. values and interpretations. Newer methods for assessing attachment styles involve using a **Q-sort technique,** in which a large number of behaviors are recorded on cards and the observer sorts the cards in a way that reflects the type of behavior that occurs within the situation (Waters, 1987). There are 90 items in the third version of the Q-sort technique, and examples of the behaviors assessed include:

- When the child returns to their mother after playing, they may become fussy for no apparent reason.
- When a child is upset or injured, they will accept comfort from adults other than their mother.
- The child often hugs or cuddles against their mother, without her asking or inviting the child to do so.
- When the child is upset by the 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 to 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 various age groups, cultures, and clinical populations.

Secure Attachment and Continuity of Care

Continuity of care refers to the consistent presence of caregivers who provide stable, reliable emotional and physical support throughout a child's early development stages. The idea of continuity of care is neither new nor innovative. The term was first noted in published medical research dating back to the 1950s. It shifted by the 1970s to a more modern definition that included uninterrupted and coordinated care (Uijen, Schers, Schellevis, & van den Bosh, 2012). In the newer multidimensional models, continuity of care has expanded to consider the quality of care over time (Gulliford, Naithani, & Morgan, 2006), focusing on the relationship between patient and caregiver, communication, flexibility, and accessibility to the services provided (Uijen et. al., 2012).

In an early childhood environment, continuity of care focuses on many of these same aspects. When infants experience consistent caregiving over time, they are more likely to develop a secure attachment, which leads to a stable sense of trust, safety, and confidence in their environment. For example, in childcare settings or foster care, maintaining a consistent caregiver or a small

group of familiar caregivers is crucial. When infants experience frequent changes in caregivers, their emotional needs may go unmet or be inconsistently addressed, leading to feelings of insecurity and distress. A lack of continuity can contribute to attachment disruptions, such as ambivalent or avoidant attachment styles, which manifest in behaviors such as excessive clinginess, resistance to comfort, or emotional distancing (Ainsworth et al., 1978).



Figure **13.5.3.2.** Continuity of care in early learning programs is when one or multiple caregivers transition with a group of children to the next classroom. Image by Heather Carter is used with permission.



Figure **13.5.3.3.** This teacher "looped" with the same classroom, transitioning from the infant room to the toddler room, and remained with the same group for two years. Image by Heather Carter is used with permission.

In the case of early learning program settings, maintaining continuity of care means having consistent caregivers who are responsive to the infant's needs and are familiar with the child's temperament, preferences, and routines. Research has proven that interactions and relationships directly support children's learning through exploration, expression of feelings, and the ability to solve problems (Sparks, 2019). Additionally, the effects of such positive relationships, specifically concerning cognitive development and children's behavior, are long-lasting, well into the 3rd grade (MaldonadoCarreño & Vortruba-Drazl, 2011).

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13.5.4: Attachment as Related to Biology and Culture

Learning Objectives

1. Explain how biological systems influence stress responses in relation to attachment styles.
2. Identify how genetic variations interact with caregiving to shape attachment outcomes.
3. Discuss the long-term developmental and health implications of secure and insecure attachment from a biological perspective.
4. Compare how attachment behaviors and expressions differ between individualistic and collectivist cultural contexts.
5. Analyze how cultural practices influence caregiving and the formation of secure attachment relationships.

The Biology of Attachment

Attachment not only involves emotional bonds but also has strong biological roots that affect the brain and body. Research has found that the body's stress response system plays a critical role in attachment. How infants react to separation from their caregiver or novel situations are not just behavioral—they also involve physiological changes that are deeply embedded in biology. One key component in this system is the hormone *cortisol*, which activates the fight-or-flight response and impacts the immune system. The patterns of cortisol production differ based on attachment style, reflecting how children react to stress and how their bodies manage it.

- Infants with an ambivalent attachment style often show an overactive stress response. They become extremely distressed when separated from their caregiver, and even after the caregiver's return, they may not be easily soothed. This overreaction to stress is associated with high levels of cortisol, indicating that the child's body is in a constant state of alertness. Children's brains may be programmed to remain vigilant due to inconsistent or unpredictable caregiving experiences, leading to heightened stress responses in the future (Gunnar et al., 2007).
- On the other hand, infants with an avoidant attachment style tend to show a lower level of stress response. These children may appear emotionally distant or avoidant of their caregiver, even in situations of distress. This underactive stress response system might reflect a numbing or shutting down of emotional responses as a way to cope with a lack of emotional availability from the caregiver. These children may exhibit lower levels of cortisol, signaling that they may not react strongly to distressing events. However, this underreaction can indicate an inability to form healthy emotional bonds, which can impact social and emotional development (Cassidy & Shaver, 2008).
- Children with disorganized attachment show inconsistent and contradictory behaviors, often approaching and avoiding the caregiver simultaneously. Research suggests that these children exhibit higher levels of a protein called *C-reactive protein (CRP)*, which is linked to inflammation in the body. High levels of CRP can signal chronic stress and lower resistance to infection or disease. This might reflect the child's constant internal conflict and confusion about their attachment figure, leading to higher biological stress markers and a compromised immune system. Disorganized attachment is often the result of unpredictable or frightening caregiving behaviors, leaving the child in a state of emotional and physiological distress (Carlson et al., 2009).

Genetic Influences

In addition to physiological responses, genetics also plays a role in shaping attachment behaviors. One of the key genetic factors involved in attachment is the *5-HTTLPR* gene, which influences how the brain processes serotonin, a neurotransmitter that regulates mood, emotion, and stress. Research has shown that variations in this gene can affect a child's susceptibility to environmental factors, such as the quality of caregiving, and influence attachment styles.

- Infants with a *short* allele of the 5-HTTLPR gene are more sensitive to environmental stressors. They may be more likely to develop insecure attachment styles if exposed to inconsistent or neglectful caregiving. For example, children with the short allele may have an increased risk of developing ambivalent or disorganized attachment styles if their caregivers are inconsistent in their responses.
- Infants with a *long* allele of the 5-HTTLPR gene tend to have a more robust and resilient stress response system, making them more likely to form secure attachments even in challenging or less-than-ideal caregiving environments. These

children may exhibit more adaptive responses to stress, with lower cortisol levels and more effective emotional regulation (Kaufman et al., 2004).

Implications for Development and Health

The biological underpinnings of attachment not only affect emotional development but also have lasting impacts on physical health. Children with secure attachment styles tend to show better overall health and resilience to stress. In contrast, those with insecure attachment styles may face challenges such as increased vulnerability to anxiety, depression, and chronic health problems. The way a child's body responds to stress—whether it's an overactive or underactive system—can influence their behavior and emotional regulation well into adulthood.

Cultural Differences

Attachment theory has traditionally been rooted in Western concepts of child development, where secure attachment is defined as the ability to form a close, trusting bond with caregivers and to use them as a secure base for exploring the world. However, as attachment theory has expanded to a global context, it has become clear that cultural norms and values shape how attachment is expressed and understood. In different cultural contexts, the characteristics of secure attachment may look different, even though the underlying concept of attachment as a bond between child and caregiver remains universal.

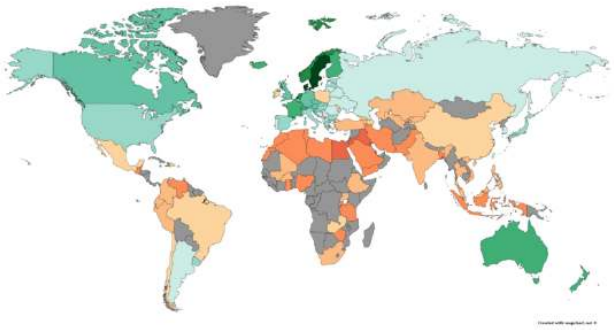


Figure 13.5.4.1. Countries colored green have cultures that are more individualistic than the world average. Countries colored in red have relatively collectivistic cultures. Image by Beugelsdijk & Welzel is licensed CC BY-SA 4.0.

In individualist societies, such as the United States and many Western European countries, independence is a highly valued trait, and caregivers often encourage their children to explore and learn independently. In these contexts, secure attachment is often associated with the child's ability to engage in independent play, explore the world, and return to the caregiver for comfort when needed.

However, in cultures that emphasize collectivism or interdependence, secure attachment may look quite different. Secure attachment in collectivist societies, such as those in East Asia, may focus more on the child's ability to maintain close, ongoing bonds with caregivers. In these cultures, secure attachment is less about the child's ability to separate from the caregiver and more about maintaining closeness and emotional synchronization with the caregiver. Children in these cultures may remain physically closer to their caregivers for longer periods. They may exhibit more distress during separations, but these behaviors are viewed as normal expressions of attachment rather than signs of insecurity. Caregivers may be more likely to practice co-sleeping or engage in other forms of physical closeness, which are seen as essential for fostering security and emotional regulation in the child (Keller, 2013).

Cultural Influence on Attachment Behaviors

Culture also plays a role in how attachment behaviors are interpreted. For example, in some cultures, emotional expression may be seen as inappropriate or overly dependent, while in others, expressing vulnerability and seeking comfort may be more acceptable. These cultural differences impact how caregivers respond to children's emotional needs and how children express attachment behaviors.

In some non-Western cultures, it is common for multiple caregivers (such as grandparents, extended family members, or other community figures) to be involved in the child's care. This can result in a broader network of secure attachment figures, and the

child's sense of security may not be limited to one primary caregiver. Still, it may extend to the extended family or community. This can contribute to a different understanding of security, where the emotional bond with caregivers is not confined to a single individual but distributed across multiple relationships (Choi et al., 2014).



Figure 13.5.4.2. A young toddler with his hand on his grandmother's leg. Image by Kaan Durmuş is licensed by Pexels.

Implications on Attachment Research and Practice

Understanding the cultural context of attachment is essential for interpreting attachment behaviors and promoting positive caregiving practices. Attachment theory offers a universal framework for understanding the significance of relationships in early childhood; however, the expression of secure attachment can vary across different cultural norms and values. Caregivers and early childhood professionals should be aware of these cultural differences to avoid misinterpreting attachment behaviors and to support children in developing secure bonds in culturally appropriate ways.

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13.5.5: Attachment Disorders

Learning Objectives

1. Describe the developmental consequences of severe deprivation and neglect in infancy.
2. Differentiate between Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED).
3. Identify effective strategies for preventing and treating attachment disorders.
4. Discuss the concept of resiliency and the factors that contribute to adaptive outcomes in the face of early adversity.

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 13.5.5.1: This is a residential nursery in 1888. Image is in the public domain.

Attachment Disorders

Attachment disorders occur when a child fails to form healthy emotional bonds with their caregivers, often as a result of neglect, abuse, or inconsistent caregiving during early childhood. These disorders can have profound effects on a child's emotional, social, and cognitive development. Insecure attachment patterns, if not addressed early, can evolve into more severe attachment disorders, including Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED). These conditions can affect a child's ability to form healthy relationships and regulate emotions throughout their life.

Reactive Attachment Disorder

RAD, or Reactive Attachment Disorder, is typically diagnosed in children who have experienced consistent neglect or emotional maltreatment in infancy or early childhood. Children with RAD may exhibit withdrawn, emotionally distant behavior, and may struggle with forming bonds with caregivers or peers. They may also display difficulty expressing emotions and show little or no response to comfort, even when upset (Zeanah et al., 2004). The disorder is often linked to institutional care or severe disruptions in primary caregiving.

The concept of RAD and the understanding of attachment disruptions were significantly informed by research conducted on children living in Romanian orphanages during the late 20th century. The fall of the Communist regime in Romania in the early 1990s led to the exposure of deeply troubling conditions in state-run orphanages, where children were subjected to severe neglect and emotional deprivation. These children were often raised in environments where caregivers were absent or unable to provide consistent, responsive, and loving care. Instead of receiving the emotional support and attention needed to form secure attachments, the children lived in overcrowded institutions with minimal human contact or individualized care.

In these institutions, children frequently faced physical neglect, malnutrition, and emotional isolation. The caregivers often lacked the training or resources to meet the children's emotional and psychological needs, which further exacerbated the attachment disruptions. As a result, children in these environments exhibited signs of RAD, including emotional withdrawal, difficulty forming relationships, and a lack of trust in others (Rutter et al., 2007).

Video	Video Description and Text Link
	Watch the video *Growing Up in a Romanian Orphange* to see and hear more about the conditions, as well as the experiences from Izidor Ruckel. Text link: https://www.youtube.com/watch?v=VCeWr8OFuEs

One of the most significant studies to emerge from this context was the Bucharest Early Intervention Project (BEIP), which began in the early 2000s and followed children who had been raised in Romanian orphanages. This longitudinal study highlighted the profound effects of early neglect on the development of secure attachment in children. Researchers found that children who were placed in foster care at an early age demonstrated significant improvements in attachment security compared to those who remained in institutional care. However, children who were institutionalized for longer periods of time before being placed in foster care often exhibited persistent attachment difficulties, underscoring the importance of early, consistent caregiving in the formation of secure bonds (Nelson et al., 2007).

Disinhibited Social Engagement Disorder

Disinhibited Social Engagement Disorder, DSED, is another attachment-related disorder, characterized by a child's overly familiar behavior with strangers, such as seeking attention or physical contact with unfamiliar adults. This condition is often seen in children who have been exposed to inadequate caregiving, such as frequent changes in caregivers or neglect in institutional settings (Zeanah et al., 2004). Unlike RAD, children with DSED do not display the same withdrawal but may engage indiscriminately with strangers, which can lead to dangerous or inappropriate interactions.

Prevention and Treatment of Attachment Disorders

Preventing attachment disorders begins with ensuring that children are provided with a stable, loving, and responsive caregiving environment. Consistency in caregiving is crucial, as children thrive in environments where their emotional and physical needs are reliably met. Early intervention programs, including those focusing on strengthening the caregiver-child bond, can help prevent attachment disruptions, particularly in children at risk due to factors such as abuse or neglect. Education for caregivers on the importance of sensitive and responsive care is an effective preventative measure. Interventions such as parent training and support groups can provide valuable resources for caregivers, promoting a deeper understanding of attachment and its critical role in child development (Schmidt, 2013).

Treating attachment disorders often requires a multi-faceted approach involving both the child and the caregiver. Therapy, such as trauma-focused cognitive-behavioral therapy (TF-CBT), can be effective in helping children with RAD or DSED process past trauma and learn healthy coping mechanisms. Additionally, therapies aimed at improving attachment, such as attachment-based therapy or Dyadic Developmental Psychotherapy (DDP), work with both the child and caregiver to repair the bond and develop healthy, secure attachment patterns.



Figure 13.5.5.2. Family therapy. Image by Kaboompics.com licensed by Pexels.

Interventions may also include fostering a safe and stable environment that allows the child to learn to trust and form secure attachments. This often involves working with caregivers to understand the child's needs, reinforcing positive behaviors, and providing consistency in caregiving. Family therapy may also be beneficial, particularly when attachment disorders are linked to family dynamics. For children in institutional settings, moving to a stable and nurturing foster care arrangement can be a significant step toward healing (Dozier et al., 2014).

Resiliency

Being able to overcome challenges and successfully adapt is a sign of **resilience**. Even young children can exhibit remarkable resilience in the face of 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. These differences play a role in attachment (Gillath et al., 2008; Seifer et al., 1996). It seems safe to say that attachment, like most other developmental processes, is affected by an interplay 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 the parent. In a direct test of this idea, Dutch researcher van den Boom (1994) randomly assigned some mothers of babies 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 exhibit a secure attachment style compared to the babies of mothers in a control group who did not receive training. [22]



Figure 13.5.5.3: This infant massage class for new mothers could provide training and support for mothers. Image is in the public domain.

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13.6: 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 13.6.1: Social and Emotional Milestones (Developmental Milestones by the CDC is in the public domain)

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

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13.7: Contexts of Development

Learning Objectives

1. Explain Bronfenbrenner's Ecological Systems Theory.
2. Identify how various family structures—such as nuclear, extended, divorced, and stepfamilies—impact infants' and toddlers' development.
3. Evaluate how the quality and consistency of non-parent care influence development.
4. Describe characteristics of high-quality early care settings and their contributions to child well-being.

Development doesn't happen in a vacuum. Children's growth is shaped by the environments they're in, and these environments are often interconnected. One way to think about how different settings influence a child's development is through Bronfenbrenner's Ecological Systems Theory. As previously discussed, he proposed that development occurs through the interactions between a child and various environments or systems that surround them.

Bronfenbrenner used the term **microsystem** to describe the settings that directly affect a child, such as their family, school, and peer group. These are the environments where children spend most of their time and where they interact with the people who are most important in their lives. In this section, we'll take a closer look at some of the key contexts that influence children's development, including family relationships, divorce, stepfamilies, grandparents, adoption, foster care, and nonparent child care.

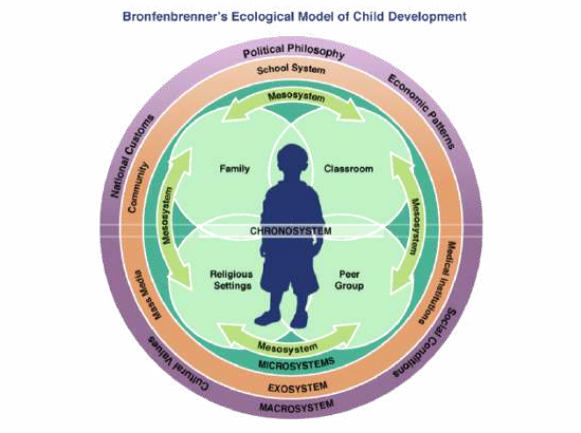


Figure 13.7.1. Bronfenbrenner's Ecological Model of Child Development. Image hosted on PNGWing is licensed CC BY-NC 4.0

Family Relationships- The Primary Context

At the heart of a child's microsystem is their family. This is usually the first and most significant environment for a young child. Families provide the foundation for social and emotional learning. The relationships a child has with family members—particularly their caregivers—play a huge role in shaping their early development.

Most children grow up in what is called a **nuclear family**, which typically consists of two parents and their children. This structure enables close, intimate interactions that are essential for emotional bonding and attachment. However, families come in many shapes and sizes, and each family dynamic influences a child's development in different ways. For example, **extended families**, where children live with or have frequent contact with grandparents, aunts, uncles, and cousins, can offer additional emotional support and social connections. This type of family setup often promotes a sense of belonging and community, as children can develop close relationships with multiple family members (Harkness & Super, 2006).



Figure 13.7.2. Extended family portrait. Image by Nick Richards is licensed CC BY-SA 2.0

Divorce and Stepfamilies

When it comes to family dynamics, divorce is an important context that can deeply affect infants and toddlers. Divorce is more common than many might think. According to the American Psychological Association (APA), about 40-50% of marriages in the United States end in divorce, which means many children are impacted by this family transition. Divorce can be emotionally challenging, and the impact of parental separation often depends on how the parents manage the change. For younger children, especially infants and toddlers, the disruptions caused by divorce—such as changes in living arrangements, emotional distress, or inconsistent caregiving—can lead to feelings of insecurity and confusion. Studies have shown that children who experience divorce may struggle with attachment issues, emotional regulation, and behavioral difficulties, especially if the divorce leads to less stability in caregiving (Amato, 2000).

Stepfamilies can present additional complexities. When a parent remarries, children may experience a shift in family dynamics and a new set of relationships to navigate. For infants and toddlers, this can mean adjusting to new caregivers, different household routines, and unfamiliar family structures. While some children adjust well, others may struggle to bond with stepparents or step-siblings. Supportive, consistent caregiving from both biological and step-parents can help children adjust and thrive in a step-family context (Ganong & Coleman, 2004).

Grandparents

Grandparents often play a significant role in children's lives, especially in cultures or situations where grandparents live with or near their grandchildren. In the United States, approximately 2.7 million children are being raised by their grandparents, often due to parental drug abuse, incarceration, or financial instability (Administration for Children and Families, 2019). Grandparents in these situations often become the primary caregivers, providing stability and support for children who may have experienced trauma or neglect in their biological homes. This can be beneficial for children, as they have the opportunity to form strong emotional bonds with older generations. Research suggests that positive relationships with grandparents can enhance a child's sense of security and provide emotional support (Bengtson et al., 2002).

Adoptive Families

Adoptive families also provide a unique context for development. Adoption can be a source of stability and love for children who may not have experienced a consistent caregiver. However, it can also come with challenges, especially if the child has experienced neglect, abuse, or trauma prior to being adopted. For infants and toddlers, the transition to an adoptive family requires forming new attachments and adjusting to new routines. Consistent caregiving and emotional support are crucial in helping these children develop trust and security (Pinderhughes et al., 2002).



Figure 13.7.3. A family of eleven, including six adopted children from Ukraine, poses to celebrate National Adoption Awareness Month. Image is hosted by Nara & DVIDS Public Domain Archive in the public domain.

As of 2021, there were about 135,000 adoptions in the United States, with many children placed in homes where they receive care and love that they were deprived of in their biological families (U.S. Department of Health and Human Services, 2022).

Foster Care

Similarly, foster care offers a safe environment for children who cannot live with their biological families. However, foster care often involves frequent moves between homes, which can disrupt attachment and create emotional distress. Research shows that children in foster care are at risk for attachment disorders, especially if they experience multiple placements or inconsistent caregiving (Dozier et al., 2001). In 2024, approximately 365,000 children were in foster care in the United States (Child Welfare Information Gateway, 2024). Stable, nurturing foster parents can provide the secure base children need to form healthy attachments.

Non-parent Care

As many families rely on non-parental care, such as early learning programs, Mother's Day Out, or preschool programs, the quality of this care can significantly impact children’s development. High-quality care settings can offer benefits similar to those of a stable home environment. Children in these settings often develop better social and cognitive skills, as they have the opportunity to interact with both caregivers and peers in a supportive atmosphere (Peisner-Feinberg et al., 2001). So what does high quality look like?

Characteristics of good programs include (Levine & Munsch, 2024, p. 241):

- "Low child-to-teacher ratios,
- Small group size,
- Staff with more education and ongoing training,
- Prior experience and education of the director,
- Low teacher turnover,
- Positive teacher-child interactions,
- Accreditation or higher-than-minimum licensing standards,
- Age-appropriate activities,
- Good health and safety practices"

In particular, the development of peer relationships in non-parent child care is an important part of a child’s social growth. Interactions with other children help toddlers and infants learn how to share, communicate, and navigate social situations. These early peer relationships can lay the foundation for the social skills needed later in life (Howes et al., 2008).



Figure **13.7.4**. Warm, responsive classrooms often include professionals who are willing to actively listen to children's thoughts and feelings, as well as take part in their daily routines and play. Image by Heather Carter is used with permission.

Another key element in non-parent child care is the program or classroom culture. A positive classroom environment, where caregivers are warm, responsive, and consistent, helps children feel safe and supported. A supportive, inclusive classroom culture also fosters a sense of community, where children feel that their needs are understood and respected. These experiences contribute to a child's emotional and social development, supporting their ability to build relationships and develop a positive sense of self (Bodrova & Leong, 2007).

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13.8: Supporting Social and Emotional Learning

Learning Objectives

1. Describe how caregivers can scaffold social play and model emotional expression for young children.
2. Discuss the importance of routines, responsiveness, and positive guidance in fostering a nurturing environment that supports social-emotional learning.

Promoting Positive Social Interactions

From birth, children are naturally inclined to engage with others. Social play helps infants and toddlers learn about emotions and build connections with caregivers and peers. The way caregivers encourage play can influence a child's social confidence and ability to interact with others.

- Simple, face-to-face and interactive games like peekaboo, pat-a-cake, and mirroring a baby's coos and expressions help infants develop early social awareness and turn-taking skills.
- As toddlers grow, they begin to play alongside other children without direct interaction. This is called parallel play. Providing opportunities for parallel play, where children play near one another with similar toys, helps them become comfortable with peer interactions.
- Older toddlers begin to engage in cooperative play, where they interact directly with peers. Games that involve taking turns, such as rolling a ball back and forth or building with blocks together, teach cooperation and patience.
- Adults can scaffold social play by modeling appropriate behaviors, offering guidance in turn-taking, and helping children interpret social cues. Encouraging simple interactions—like asking a child to hand a toy to a peer or praising a child for sharing—reinforces positive social behaviors.



Figure **13.8.1**. Giving children specific, positive praise, especially when they engage in prosocial behaviors, helps to encourage those behaviors are repeated. Image by Heather Carter is used with permission.

Modeling Emotional Expression and Social Skills

Infants and toddlers learn by observing those around them. When caregivers model positive social and emotional behaviors, young children begin to adopt these skills themselves.

- Naming emotions as they occur helps children build emotional awareness. For example, saying, "I see you're frustrated because your toy isn't working," teaches toddlers to recognize their own feelings.
- Caregivers can model healthy emotional expression by verbalizing their feelings in a manner that is appropriate. For instance, calmly saying, "I'm feeling a little frustrated right now, so I'm going to take a deep breath," demonstrates self-regulation.
- Reading books about emotions and social situations provides a safe way for toddlers to explore feelings. Asking questions like, "How do you think the character feels?" encourages empathy and perspective-taking.

- Toddlers often imitate adult behavior. When caregivers model prosocial behaviors (such as kindness, empathy, volunteering, donating, patience, cooperation, etc.), children are more likely to exhibit these behaviors themselves.

Creating a Nurturing Environment

A warm and responsive environment helps infants and toddlers feel secure, which supports their ability to learn and engage socially. Caregivers can create this environment by focusing on consistent and responsive interactions as well as predictable routines.

- Young children feel more secure when they know what to expect. Regular meal times, play times, and sleep routines help toddlers feel secure and develop self-regulation.
- Attuning to a child's cues—such as comforting a crying infant or acknowledging a toddler's frustration—teaches children that their emotions are valid and that relationships are a source of support.
- Positive guidance techniques, such as redirecting behavior, offering choices, and using gentle guidance, instead of punishment, encourage self-control and social problem-solving.
- Allowing toddlers to make simple choices, such as picking a snack or selecting a toy, fosters independence and confidence in social situations.
- Creating spaces where children feel comfortable expressing emotions—such as a cozy corner with books or a quiet area for self-regulation—can help toddlers manage their feelings effectively.



Figure **13.8.2**. Creating cozy spaces, both indoors and outdoors, where children can go for quiet time, helps them manage their feelings more effectively. In this outdoor space, a pop-up canopy is used to provide shade over pet beds for children to sit or lie while reading books. The space is clearly defined and placed away from the active play on the playground. Image by Heather Carter is used with permission.

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CHAPTER OVERVIEW

14: Physical Development in Early Childhood

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.

- 14.1: Growth in Early Childhood
- 14.2: Motor Skill Development
- 14.3: Body Image and Awareness
- 14.4: Sexual Development in Early Childhood
- 14.5: Brain Maturation
- 14.6: Health in Early Childhood
  - 14.6.1: Nutrition
  - 14.6.2: Sleep and Early Childhood
  - 14.6.3: Toilet Learning
- 14.7: Safety
- 14.8: Child Maltreatment

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14.1: Growth in Early Childhood

Learning Objectives

1. Describe average patterns of physical growth in height and weight during early childhood.
2. Explain the purpose and use of standardized growth charts in assessing child development.
3. Discuss how changes in body composition and muscle development contribute to improvements in balance, coordination, and physical activity.

Measuring Growth

Between the ages of 3 and 6, children experience steady physical growth, though at a slower pace compared to infancy and toddlerhood. Growth during this period is typically measured in terms of height and weight, providing key indicators of physical development. On average, children grow about 2.5 to 3 inches (6 to 8 cm) per year and gain approximately 4 to 5 pounds (1.8 to 2.3 kg) annually. However, growth patterns can vary based on genetics, nutrition, and overall health (Santrock, 2021).

Pediatricians and early childhood professionals use standardized growth charts to track children's physical development, comparing individual measurements to population norms. These charts, developed by organizations such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO), help identify potential growth concerns, such as undernutrition or obesity (De Onis et al., 2019). In addition to height and weight, other indicators, such as body mass index (BMI), head circumference, and muscle development, provide a more comprehensive view of a child's physical growth.

CDC Growth Charts for Boys and Girls

Figure **14.1.1**. CDC Growth Chart for Boys Age 2 to 20 years old. Document found in the public domain.

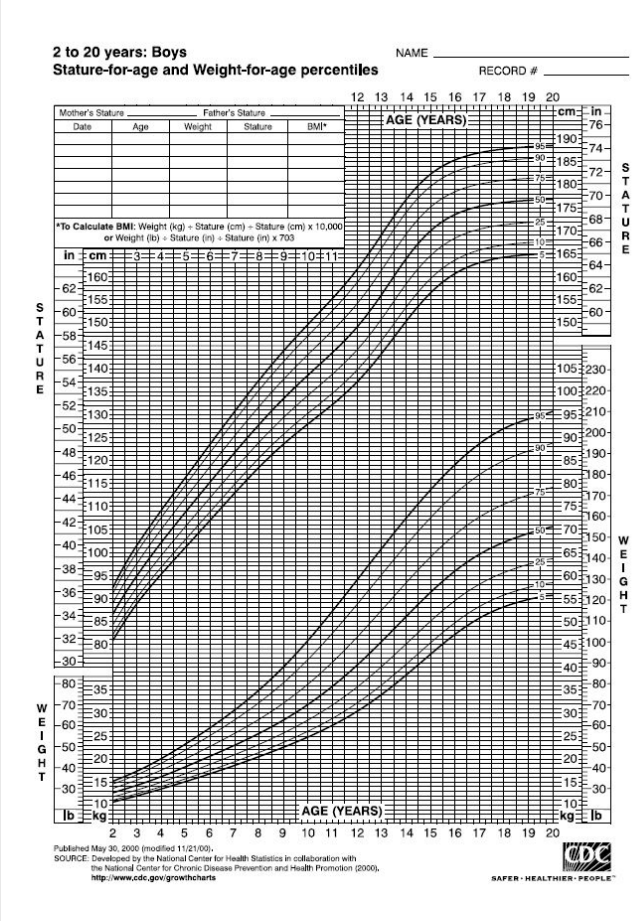
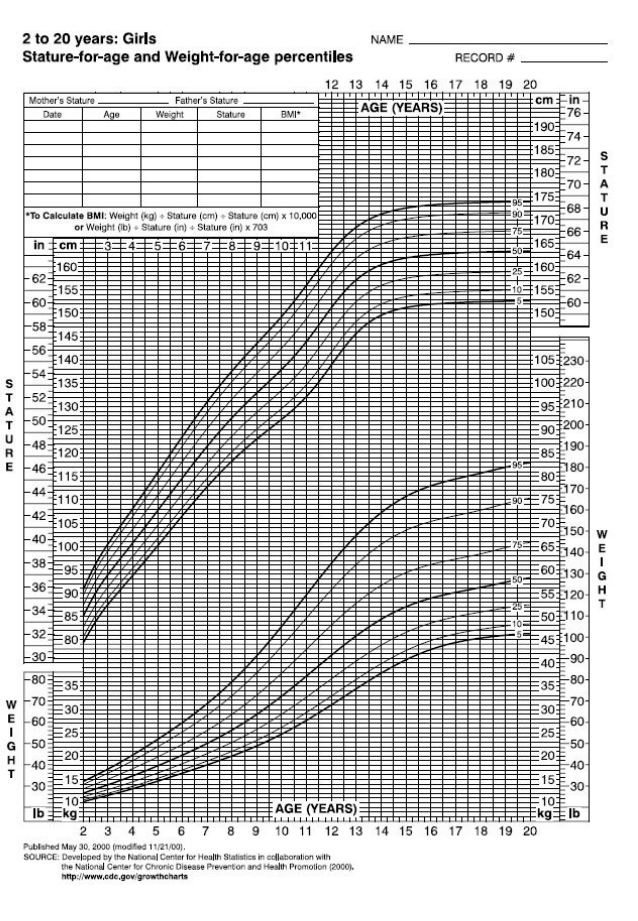


Figure **14.1.2**. CDC Growth Chart for Girls Age 2 to 20 years old. Document found in the public domain.



Body Proportions

As children grow from ages 3 to 6, their body proportions undergo significant changes, shifting from the more top-heavy appearance of toddlers to a leaner, more adult-like physique. One of the most noticeable changes is the gradual elongation of the torso and limbs. During infancy and toddlerhood, a child's head is disproportionately large compared to the rest of the body, but as growth continues, the head-to-body ratio becomes more balanced (Berk, 2020).

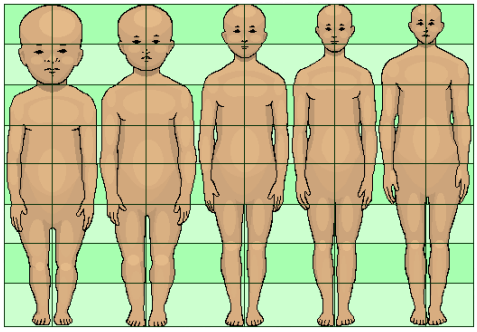


Figure 14.1.3. Human body proportions at birth, 2 years, 6 years, 12 years, and 19 years old.
Image by Ephert is licensed under CC BY-SA 4.0

The arms and legs grow longer, and the torso extends, resulting in a more upright and proportionate posture. These changes contribute to improvements in balance and coordination, enabling children to refine their gross motor skills, such as running, jumping, and climbing. Muscle development also progresses, with increasing strength in the core and limbs, supporting greater endurance and agility (Gallahue & Donnelly, 2019).

Additionally, the skeletal system continues to mature, with bones lengthening and becoming denser. This period also marks the gradual loss of baby fat, giving children a leaner appearance. The spine straightens, reducing the characteristic toddler "potbelly" as abdominal muscles strengthen. These proportional changes not only reflect physical maturation but also support the child's increasing independence and ability to engage in complex physical activities (Santrock, 2021).

Portraits of a boy at 18 months old and 6 years old.

Figure 14.1.4. 18-month-old boy. Image by Heather Carter is licensed CC BY-NC-ND 4.0



Figure 14.1.5. 6-year-old boy. Image by Heather Carter is licensed CC BY-NC-ND 4.0



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14.2: Motor Skill Development

Learning Objectives

1. Describe typical gross and fine motor milestones during early childhood.
2. Identify play-based activities that support the development of motor skills in young children.
3. Recognize the signs and characteristics of developmental coordination disorder (DCD).

Early childhood is a time when children are particularly drawn to motion and music. 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 **14.2.1**: Gross Motor Milestones. Developmental Milestones by the CDC is in the public domain.

Typical Age	What Most Children Do by This Age
3 years	• Climbs well • Runs easily • Pedals a tricycle (3-wheel bike) • Walks up and down stairs, one foot on each step
4 years	• 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 14.2.1: Children riding tricycles together. Image by Hanscom Air Force Base is in the public domain.

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 typically developing children.

Table 14.2.2: Fine Motor Milestones. Developmental Milestones by the CDC is in the public domain.

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 develop and refine their fine motor skills. Fine motor skills develop more slowly than gross motor skills, so it is essential 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 14.2.2: Children coloring. Image by Spangdahlem Air Base is in the public domain.

Developmental Coordination Disorder

While most children naturally gain better control of their bodies as they grow, some children struggle with movement in a way that goes beyond the normal range of development. These children may have developmental coordination disorder (DCD), a motor skills disorder that makes it difficult to perform everyday tasks that require coordination. This is not due to a medical condition, such as cerebral palsy or muscular dystrophy, but rather a delay in motor skill development that affects a child's ability to plan and execute movements.

Children with DCD may appear clumsy, struggle to learn to ride a bike, or have difficulty using scissors or buttons. They might avoid playground games or group activities, not because they don't want to play, but because the movements involved are frustrating or overwhelming. DCD can impact both gross motor (e.g., running, jumping) and fine motor (e.g., writing, tying shoes) development.



Figure 14.2.3. Sensory integration exercises can help improve children's coordination and balance. Image by Skill Point Therapy is licensed CC BY-NC 4.0.

Early signs may be noticed in preschool or kindergarten when children are expected to do more on their own. Children with DCD may also struggle with academic tasks such as writing, organizing school materials, or completing art projects. Early support and understanding can make a big difference for children with DCD. Physical or occupational therapists can be helpful in designing individual support plans and suggesting games or exercises that are both fun and therapeutic. Importantly, caregivers and early childhood professionals should foster a safe and inclusive environment where all children feel supported in their efforts to grow and learn at their own pace.

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14.3: Body Image and Awareness

Learning Objectives

1. Define body awareness.
2. Explain the role of proprioception in early childhood development.
3. Identify activities that promote body awareness and physical confidence in young children.

Body awareness, or the ability to recognize and understand one's own body in relation to its surroundings, develops significantly during early childhood. A crucial component of body awareness is proprioception, the sense of body position and movement, which is facilitated by sensory receptors in muscles, joints, and ligaments. Proprioception enables children to navigate their environment and control their movements, allowing them to perform activities such as running without looking at their feet or reaching for an object without direct visual guidance (Gallahue & Donnelly, 2019).

Proprioceptive feedback is crucial for motor development and coordination, as it enables children to adjust their movements in response to internal sensory information. This feedback helps with tasks ranging from climbing and jumping to writing and drawing. A well-developed proprioceptive system supports independence and confidence in physical activities, reducing the likelihood of clumsiness or movement-related anxiety (Levine & Munsch, 2024). How can we support this? Engaging children in activities that promote body awareness- dancing, yoga, active play, and simple games such as "Hokey-Pokey" or "Red Light-Green Light"- helps them develop a strong connection between their minds and bodies. Providing a supportive environment where children can explore movement freely contributes to both their physical confidence and overall well-being (Santrock, 2021).



Figured 14.3.1. A young boy is engaging in a simple yoga pose. Image by Neeclick is licensed CC0.

During this period, children also begin to form an early sense of body image. Their perceptions of their bodies are influenced by their own experiences, feedback from caregivers, and cultural norms. Positive reinforcement and opportunities for active play support a healthy body image, fostering confidence in their physical abilities. Conversely, negative comments or unrealistic societal standards may contribute to body dissatisfaction even at a young age (Levine & Munsch, 2024).

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14.4: Sexual Development in Early Childhood

Learning Objectives

1. Describe typical early childhood behaviors related to body awareness and curiosity.
2. Distinguish between healthy sexual exploration and behaviors that may be cause for concern.
3. Explain how adult responses influence children's developing sense of bodily autonomy and sexuality.
4. Identify age-appropriate strategies for supporting healthy sexual development.

During early childhood, children become increasingly aware of their bodies and how they function. This includes recognizing differences between boys and girls and understanding basic bodily functions. Curiosity about bodies is a natural part of development and can manifest in various ways, such as:

- Exploring their own bodies through touching or looking.
- Asking questions about body parts and differences.
- Engaging in pretend play that may include elements of imitating adult behaviors or scenarios that might highlight differences, such as kissing or playing doctor.

Healthy vs. Concerning Behaviors

These behaviors, when displayed spontaneously and innocently, are considered a normal part of childhood development. While curiosity about the body is typical, adults need to recognize the distinction between natural exploration and behaviors that may require guidance or intervention. Healthy, age-appropriate behaviors include occasional self-touching or self-stimulation, asking questions about where babies come from, or showing an interest in anatomical differences without becoming preoccupied by it. For example, 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).[20]

Concerning behaviors that may require further attention will likely include compulsive or excessive self-touching that interferes with daily activities, engaging in sexualized behaviors that mimic those of an adult, and/or coercive or aggressive interactions with other children regarding their private parts. If concerning behaviors arise, it is important for caregivers and professionals to approach the situation calmly and seek guidance from a pediatrician or child development specialist.



Figure 14.4.1. Healthy, age-appropriate behaviors are a part of natural sexual exploration in early childhood. When boundaries are crossed or behavior becomes concerning, guidance should be sought from specialists. Image on Pixaby is in the public domain.

Adult Reactions

Adults' reactions to children's curiosity about their bodies shape how they perceive their own sexuality and bodily autonomy. Negative reactions, such as scolding or shaming, can create feelings of confusion, guilt, or embarrassment. Instead, when sexual behavior occurs, adults should pause, redirect, listen, and teach. By pausing, adults can gather their thoughts and remain calm to consider the situation more effectively. Redirect sexual behavior by using positive guidance and giving children another way to engage. For example, you might say, "Let's go wash your hands and read a book". If the child(ren) involved can communicate their actions, follow up after the incident by asking open-ended questions and actively listening to their responses. Understanding what happened from the child's perspective helps us understand their intentions. This can inform the best approach for teaching safe, healthy sexual development (Virtual Lab School, 2023).

Encouraging Healthy Sexual Development

Ways adults may encourage healthy sexual development include:

- Provide honest and straightforward answers that are age-appropriate.
- Using correct anatomical terms for body parts to promote body positivity and knowledge.
- Provide basic information about reproduction (babies grow in a woman's uterus).
- Set clear and supportive boundaries around privacy and establish what behaviors are and are not acceptable.
- Explain the difference between wanted and unwanted touch.
- Reinforce the concept of consent, including letting children know that their body belongs to them and they can say "no" to unwanted touch, but that this also means being respectful of others' boundaries.

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14.5: Brain Maturation

Learning Objectives

1. Describe the processes of synaptogenesis and synaptic pruning.
2. Explain how myelination and prefrontal cortex development influence behavior and learning.
3. Identify the functions of the left and right hemispheres of the brain and describe the role of the corpus callosum in coordinating tasks between them.
4. Recognize how children's drawings reflect changes in brain development and visual-motor integration.

Brain Development

The brain is about 75 percent of its adult weight by two years of age. By the time a child reaches the age of five, their brain is approximately 90% of its adult size. However, growth is not just about size—it's about the connections forming within the brain. Neurons, the brain's nerve cells, communicate through synapses, and during early childhood, the brain creates trillions of these connections. This process, known as ***synaptogenesis***, allows children to process information more efficiently and supports their ability to learn new skills. This surplus of connections provides children with the flexibility to adapt to different environments and experiences.

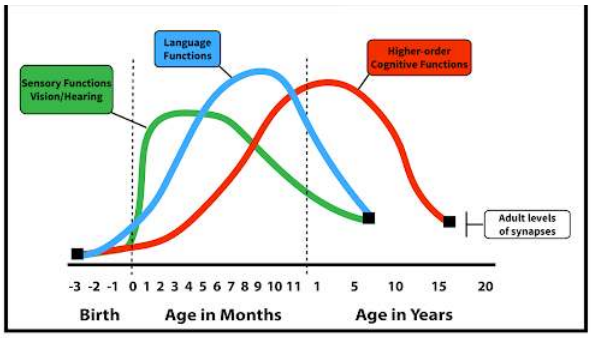


Figure **14.5.1**. The number of new synapses related to sensory function, language skills, and higher-order cognition across development. Synapse formation related to sensory functioning is thought to peak first, followed by language skills, and lastly, higher-order cognitive functions. Syanpse Formation Across Development © by the National Library of Medicine is licensed CC BY-NC-SA.

However, not all of these connections are necessary, which leads to the next important process- synaptic pruning. **Synaptic pruning** eliminates weaker or unused synapses, strengthening the connections that are most frequently used. Therefore, the process of synaptic pruning is heavily influenced by experience (Greenough et. al, 1987). By removing excess connections, the brain becomes more efficient at both cognitive and motor functions (Tierney & Nelson, 2009). The timing of pruning varies across brain regions. The visual and auditory cortices undergo pruning earlier, while areas related to higher-order thinking, such as the prefrontal cortex, continue to undergo pruning well into adolescence (Huttenlocher, 1990).

The Prefrontal Cortex and Myelination

Myelination and the development of dendrites continue to occur in the cortex. As it does, we see a corresponding change in the child's abilities. Significant growth in the **prefrontal cortex** (the area of the brain behind the forehead that helps us to think, strategize, and control emotion), and **white matter** (which consists of myelinated nerve fibers) makes it increasingly possible to control emotional outbursts and to understand how to play games (Pujol et. al, 2006; Giedd et. al, 1999).

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]

Growth in the Hemispheres and Corpus Callosum

Between the ages of three and six, the left hemisphere of the brain undergoes dramatic growth. This side of the brain or hemisphere is typically involved in language skills (Friederici, 2012). The right hemisphere continues to grow throughout early childhood and is engaged in tasks that require spatial skills, such as recognizing shapes and patterns, as well as creativity. The **corpus callosum,** which connects the two hemispheres of the brain, undergoes a growth spurt between the ages of three and six, resulting in improved coordination between tasks performed by the right and left hemispheres. This is referred to as brain **lateralization**. Hand preference also becomes more pronounced in early childhood as a result of lateralization, and is usually established by the age of four or five (Michel et al., 2013).

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 the age of 3, the child begins to draw wispy creatures with heads and little other detail. Gradually, pictures start to have more detail and incorporate more parts of the body. Arm buds develop into arms, and faces acquire noses, lips, and eventually eyelashes.



Figure 14.5.2: Early scribbles. Image by Wikimedia is licensed CC BY-SA 3.0.



Figure 14.5.3: Creatures with heads. Image by torange.biz is licensed CC-BY 4.0.



Figure 14.5.4: A detailed face. Image by torange.biz is licensed CC-BY 4.0.

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SECTION OVERVIEW

14.6: Health in Early Childhood

Learning Objectives

1. Identify common food allergens.
2. Describe how to manage food allergies in early childhood settings.
3. Explain the importance of oral health during early childhood.
4. Discuss the role of immunizations and booster shots in protecting children from illness.
5. Describe proper handwashing techniques and explain why hand hygiene is essential for disease prevention.
6. Outline caregiver responsibilities in promoting and protecting the health of young children.

While preschoolers are becoming increasingly independent, they still depend on their caregivers to continue protecting and promoting their health. [21]

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, as seen in cases of 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 severe allergic reactions in the United States: milk, eggs, fish, shellfish, wheat, soy, peanuts, and tree nuts.



Figure 14.6.1: The most common food allergens make up 90% of the allergic reactions in the U.S. Image by the USDA in the public domain.

The symptoms and severity of allergic reactions to food can vary between individuals and may also change over time for the same person. 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 by 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 who 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 see the dentist every six months.[26]



Figure 14.6.2: A dentist checking a child's teeth. Image by Trinity Care Foundation is licensed CC BY-NC-ND 2.0.

Protection from Illness

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

Immunizations

While vaccines are typically initiated in infancy, children require additional doses of vaccines to maintain their protection. These boosters, administered between the ages of 4 and 6, are supplemental doses of the vaccines received earlier in life to help maintain optimal protection against vaccine-preventable diseases.



Figure 14.6.3: Vaccines. Image by Ramstein Air Base is in the public domain.

Many states require children to be fully vaccinated (unless they have a valid medical reason for exemption) 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 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 most effective 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 the nose, coughing, or sneezing.
- After using the toilet.
- After touching an animal, animal feed, or animal waste.
- After touching garbage.

Children need to learn how to wash their hands properly. When washing their 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 the 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 14.6.4: A mother helping her son wash his hands. Image is in the public domain.

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]

Topic hierarchy

14.6.1: Nutrition

14.6.2: Sleep and Early Childhood

14.6.3: Toilet Learning

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14.6.1: Nutrition

Learning Objectives

1. Describe the importance of and caregiver influences on establishing healthy eating habits in early childhood.
2. Identify age-appropriate nutritional needs and caloric requirements for young children.
3. Recognize common challenges in early childhood eating, and describe strategies to support positive mealtime behaviors.
4. Explain the impact of food insecurity on child development.
5. Define childhood obesity.
6. Identify the factors, including behavioral and environmental influences, that contribute to childhood obesity.
7. Discuss the short- and long-term health consequences of childhood obesity.
8. Identify strategies for preventing and managing childhood obesity.

Early childhood is a critical window for developing lifelong eating habits. Research indicates that dietary patterns formed during this period often persist into adolescence and adulthood (Birch & Anzman-Frasca, 2011). Establishing good nutrition habits early on helps reduce the risk of obesity, promotes overall health and adequate growth, and encourages a positive relationship with food and healthy eating behaviors.

Healthy Eating and Habits

Healthy eating in early childhood involves consuming a well-balanced diet that provides essential nutrients for growth and development. According to the Dietary Guidelines for Americans (2020-2025), a nutritious diet for young children includes fruits, vegetables (particularly dark green vegetables), whole grains, protein sources, dairy products, and healthy fats, such as those found in fish, nuts, or avocados.

Parents and caregivers play a crucial role in shaping children's eating habits by modeling healthy food choices, maintaining structured mealtimes, and introducing a variety of foods. 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] However, young children also have smaller stomachs and higher energy needs relative to their size, meaning they require frequent and nutrient-dense meals and snacks throughout the day.

Recommendations to Promote



Figure 14.6.1.1: Offering opportunities to try different and/or new foods with a variety of flavors and textures helps children learn balanced eating habits. Image by USDA is licensed CC0.

Parents and caregivers need to keep in mind that they are setting up taste preferences at this age and set up a supportive food environment. Young children who become accustomed to high-fat, very sweet, and salty flavors may struggle to eat foods with more subtle flavors, such as fruits and vegetables. By offering a variety of foods, children are exposed to diverse flavors and textures, which contributes to more balanced eating habits. Structured mealtimes, or windows, can help reduce grazing and reliance on processed foods.

Picky Eaters and Appetite Changes

Picky eating is a common behavior among young children, often peaking between ages 2 and 5 (Brown et al., 2016). This phase is developmentally normal and can stem from various reasons. Some children have a natural tendency to be more cautious about new foods, often referred to as **neophobia**. Others develop increased sensory sensitivities to certain textures or flavors, and/or have an increased desire for independence in control over their food choices.

The slower rate of growth in early childhood is also 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. Parents and caregivers may find the reduction in appetite frustrating and become concerned that the child is going to starve.

So, how can parents and caregivers manage picky eating and these changes in appetite?

- By eating as a family, adults can model positive food behaviors, such as trying new foods or balancing their plates to include foods from all the food groups.
- Children often benefit from repeated exposure to foods. A child may have to try a new food 10-15 times before developing a taste for it (More, 2015).
- Coercing and pressuring children will likely increase their refusal and create negative associations, so creating a pressure-free environment is key.
- It is also not a good idea to restrict a food they like and use it as a reward for eating a food they dislike. This strategy is also likely to backfire, increasing the child's desire for the restricted food and having little or no impact on their attitude towards the disliked food (Parker-Pope, 2008).
- Finally, allowing children to be involved in the food preparation process tends to increase their interest in trying new foods.

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 they are not given well-balanced nutrition or if they consume too much milk, as calcium can interfere with the absorption of iron in the diet.

Food Insecurity

Food insecurity is the lack of consistent access to adequate food and affects millions of young children in the United States. According to the U.S. Department of Agriculture (USDA, 2022), one in eight children lives in a household that is food insecure. Food insecurity can have numerous impacts on young children, leading to poor growth and developmental delays, increasing the risk of chronic illnesses such as anemia and obesity, as well as behavioral and emotional challenges, including anxiety about food availability (Gundersen & Zaliak, 2015).

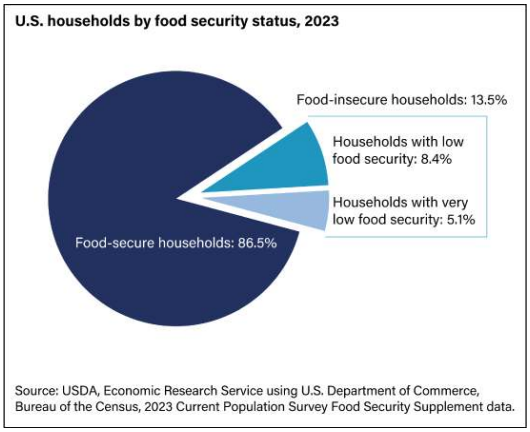


Figure 14.6.1.2: 13.5 percent (18.0 million) of U.S. households were food insecure at some time during 2023. The 2023 prevalence of food insecurity was statistically significantly higher than the 12.8 percent (17.0 million) in 2022. Image by USDA is in the public domain.

Programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the Child and Adult Care Food Program (CACFP) provide support to families experiencing food insecurity, helping ensure children receive adequate

nutrition.

Childhood Obesity

Childhood obesity is a complex health issue. It occurs when a child is significantly above the normal or healthy weight for their age and height. Childhood obesity is a serious problem in the United States, putting children at risk for poor health. According to the Centers for Disease Control and Prevention (CDC, 2024), approximately 14.7% of children aged 2- to 5-year-olds were classified as obese.

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

Causes of Obesity

The causes of excess weight gain in young children are similar to those in adults, including factors such as a person's behavior and genetics. Behaviors that influence excess weight gain include (Simmonds et. al, 2016):

- 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 14.6.1.3: A child watching TV instead of playing. Image by Melissa Gutierrez is licensed under CC-BY-2.0.

Consequences of Obesity

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

- More Immediate Health Risks
  - High blood pressure and high cholesterol 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 gastroesophageal 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 are obese are more likely to become adults with obesity. 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.

Obesity Prevention and Management

Preventing and managing obesity in early childhood necessitates a comprehensive approach that involves families, schools, and communities. It starts with encouraging healthy eating habits based on many of the strategies shared earlier in this section in

addition to promoting mindful eating (eating slowly and recognizing hunger/fullness cues to avoid overeating). Other strategies include increasing physical activity and encouraging outdoor play. Young children should engage in at least three hours of physical activity per day (WHO, 2019).

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14.6.2: Sleep and Early Childhood

Learning Objectives

1. Explain the physiological importance of sleep and its role in learning and overall health.
2. Describe general sleep requirements for children and how these needs change with age.
3. Identify and differentiate between common sleep disturbances in childhood.
4. Identify supportive strategies caregivers and professionals can use to promote healthy sleep habits and manage sleep-related behaviors.

Along with food and water, sleep is one of the most important physiological needs of the human body—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 state, and level of physical 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.

Although there is no magic sleep number, there are general guidelines for the amount of sleep different age groups require. For instance, children need more sleep per day to develop and function properly, with newborn babies requiring up to 18 hours of sleep, and the amount of sleep decreasing as they age. 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 hours, and adults generally need between 7 and 9 hours.



Figure 14.6.2.1: A child sleeping. Image by Peter Griffin is in the public domain.

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 they are asleep, saying meaningless words and even engaging in arguments with people who are not present. 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 during the first few hours of sleep, specifically in 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]

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14.6.3: Toilet Learning

Learning Objectives

1. Identify the average age range and developmental signs that indicate readiness for toilet learning.
2. Describe the typical progression of toilet learning.
3. Define and differentiate between elimination disorders.

The toilet learning process 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 master the toilet learning process is 29 months, and for boys, it is 31 months. By 36 months, 98% of children have mastered the process (Boyse & Fitzgerald, 2010). However, it is not the child's age that is as important as his/her physical and emotional readiness. If started too early, it might take longer for a child to engage in and master the toilet learning process..

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

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

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



Figure 14.6.3.1: A child learning to be toilet trained. Image by Manish Bansal is licensed under CC-BY-2.0.

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 aged 15 years or older. Approximately 1% of 5-year-olds experience encopresis, and it is more prevalent in males than in females. A medical professional diagnoses these and may require treatment. [19]

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14.7: Safety

Learning Objectives

1. Identify the leading causes of injury and injury-related death among children in early childhood.
2. Describe common types of unintentional injuries.
3. Explain the importance of caregiver supervision and environmental safety in reducing the risk of injuries.
4. Summarize best practices for car seat safety, including the rationale behind extended rear-facing use and the appropriate transitions to booster seats.
5. Recognize how laws and misconceptions can influence unsafe practices in vehicle safety for children.

Injuries and Accidents

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 specific 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 under 15.
- For children ages 0 to 9, the following 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]

Table **14.7.1** summarizes some tips from the CDC to protect children from these injuries:

Table **14.7.1**: Preventing Injuries

Type of Injury	Prevention Tips
Burns	• Have smoke alarms on every floor and in all rooms people sleep in • Involve children in creating and practicing an escape plan • 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]
Drowning	• Make sure caregivers are trained in CPR • Fence off pools; gates should be self-closing and self-latching • Have children wear life jackets in and around natural bodies of water • Supervise children in or near water (including the bathtub)[36]
Falls	• 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) • Make sure children are wearing protective gear during sports and recreation (such as bicycle helmets) • Supervise children around fall hazards at all times[37]
Poisoning	• 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) • 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
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 14.7.1: Children playing on a jungle gym at a park. Image is in the public domain.

Car Seat Safety

In spite of all the technology and sophisticated systems available in vehicles, car crashes are still a leading cause of death and injury to children (National Highway Traffic Safety Administration [NHTSA], 2021). The American Academy of Pediatrics and safety experts strongly recommend that children remain in a rear-facing car seat for as long as possible, yet many parents transition their children to forward-facing seats too early. This issue is compounded by confusing and inconsistent language in passenger safety laws, leading to misinterpretation and premature forward-facing transitions (Hoffman et.al, 2022).

For example, in Kansas, it is required that infants from birth to 1 year old and weighing up to 20 lbs ride in a rear-facing position. Between 20-40 lbs and over 1 year old, children may ride forward-facing. But this does not mean that they should; it just means that they can. Studies show that many caregivers assume the legal minimum is the safest recommendation (Hoffman et.al, 2022).

Rear-facing car seats are designed to distribute crash forces across the child's back, head, and neck, significantly reducing the risk of severe injury or death (Bull & Durbin, 2008). Young children have underdeveloped musculoskeletal systems (including their neck muscles and spinal structures) coupled with disproportionately larger heads, making them highly vulnerable to injury in a crash. In a frontal crash, a forward-facing child's head is thrown forward, placing extreme stress on the neck and spine, which can lead to internal decapitation- a fatal injury where the spinal cord separates from the skull (Arbogast et.al, 2017).



Figure **14.7.2**: Rear-facing 3-year-old child. Image by Heather Carter is licensed CC BY-NC-ND 4.0

Many convertible car seats now have extended rear-facing limitations, allowing children to remain rear-facing until they weigh 40-50 pounds. Most children will outgrow the maximum height of the seat, as seat straps in a rear-facing position must sit just below the shoulders, before they will exceed the upper limit of the seat.

Once the child has outgrown the forward-facing seat with a 5-point harness, they should transition to a booster seat. When should a child move to a booster seat? It is safe to move to a traditional booster seat when "yes" can be answered to all the statements below.

1. There's a shoulder and lap belt.
2. The child is at least 40 lbs.
3. The child is at least 5 years old.
4. The child can sit properly for the entire trip without leaning forward, slouching, playing with the shoulder belt, or sitting on their knees.

Young children under the age of 5, or even 6, are safer in a 5-point harness if they still fit in it (The Car Seat Lady, 2025).

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14.8: Child Maltreatment

Learning Objectives

1. Identify and describe the four main types of child maltreatment.
2. Recognize common characteristics of victims and perpetrators of child maltreatment.
3. Summarize the role and responsibilities of Child Protective Services (CPS) and mandated reporters in identifying and responding to child abuse and neglect.
4. Explain the steps involved in the CPS investigation process and possible outcomes.
5. Discuss the short- and long-term consequences of child maltreatment.
6. Describe the broader societal impacts of child maltreatment and the importance of prevention and intervention strategies.

Child maltreatment is a serious public health issue that affects millions of children worldwide. It encompasses various forms of abuse and neglect that can have long-term consequences on a child's development, mental health, and overall well-being. Understanding the different types of maltreatment, protective systems in place, and the effects on victims is critical to improving prevention and intervention efforts.

Types of Maltreatment

The Centers for Disease Control and Prevention (CDC, 2023) and the U.S. Department of Health and Human Services (USDHHS, 2023) classify child maltreatment into four main categories:

1. **Physical Abuse** – Intentional harm or injury inflicted on a child through hitting, beating, burning, or other physical acts. Signs may include bruises, fractures, and other unexplained injuries (Cicchetti & Valentino, 2020).
2. **Emotional (Psychological) Abuse** – Persistent behaviors that harm a child's self-worth or emotional well-being, such as verbal abuse, threats, humiliation, or social isolation (Spinazzola et al., 2014). This form of abuse can be challenging to detect but has long-lasting psychological effects.
3. **Sexual Abuse** – Any form of sexual contact or exploitation of a child by an adult or older child. This includes molestation, rape, incest, and child pornography (Finkelhor, 2020).
4. **Neglect** – The failure of a caregiver to provide a child with basic necessities such as food, shelter, medical care, education, and emotional support. Neglect is the most commonly reported form of maltreatment (USDHHS, 2023).



Figure 14.8.1. Child with facial bruising. Image by JulesQJones is licensed CC BY-SA 3.0

Incidence of Maltreatment

In 2021, approximately 600,000 children were confirmed victims of abuse or neglect in the United States. Tragically, child maltreatment results in daily fatalities. On average, four to five children die each day due to abuse or neglect, with the majority of these children under the age of 3 (USDHHS, 2023). Infants and toddlers are most at risk due to their dependence on caregivers. Children from low-income families and those with disabilities are also at greater risk.

Victims and Perpetrators

In 77% of cases, the parents(s) of the child are the perpetrator(s) (USDHHS, 2023). Mothers are more likely to be reported in cases of neglect, while fathers are more frequently identified in physical abuse cases. Non-parent perpetrators, including other relatives, foster parents, and other caregivers, make up a smaller percentage of cases. However, the common thread is that victims almost always know their perpetrator. It is rare for the perpetrator to be someone unknown to the child or family.

Child Protective Legislation and the CPS System

In the United States, several laws exist to protect children from maltreatment. The Child Abuse Prevention and Treatment Act (CAPTA), first enacted in 1974 and reauthorized multiple times, provides federal funding and guidance to states in preventing and responding to child abuse (USDHHS, 2023).

Each state has a Child Protective Services (CPS) system responsible for investigating reports of maltreatment, providing interventions, and ensuring child safety. Reports to CPS may come from mandatory reporters such as teachers, healthcare providers, and law enforcement or from concerned citizens (Font & Maguire-Jack, 2020). If maltreatment is substantiated, CPS may offer family services, remove the child from the home, or pursue legal actions against perpetrators.

Mandated Reporters

Mandated reporters are defined differently in each state. However, at a minimum, mandated reporters are typically those in roles responsible for children's health and/or well-being, such as teachers, healthcare providers, social workers, law enforcement personnel, and childcare professionals. They are legally required to report suspected abuse or neglect. In 2021, over 4 million reports of child maltreatment were made in the U.S., with 66.7% coming from professionals such as mandated reporters (USDHHS, 2023).

CPS Investigation Process

The Child Protective Services (CPS) investigation process begins when a mandated reporter or other concerned individual makes a report of suspected child maltreatment. The process aims to ensure child safety while prioritizing family preservation whenever possible.

- Upon receiving a report, CPS conducts an initial screening to determine whether the allegations meet the legal criteria for investigation.
  - Reports that do not meet the criteria are screened out, while those that do proceed to an investigation.
- During the investigation, CPS caseworkers gather information through interviews with the child, caregivers, and other relevant individuals, as well as home visits and reviews of medical or school records.
  - The goal is to assess the child's safety, determine the presence and severity of maltreatment, and evaluate the family's ability to provide a safe environment.
  - If immediate danger is identified, CPS may implement a safety plan or seek emergency protective custody.
- Based on the findings, CPS will classify the case as substantiated (evidence of maltreatment is found), unsubstantiated (insufficient evidence), or indicate a risk of harm requiring intervention.
- In cases of substantiated abuse or neglect, CPS may offer services to support the family, refer the case to the juvenile court for protective action, or recommend foster care placement when necessary.

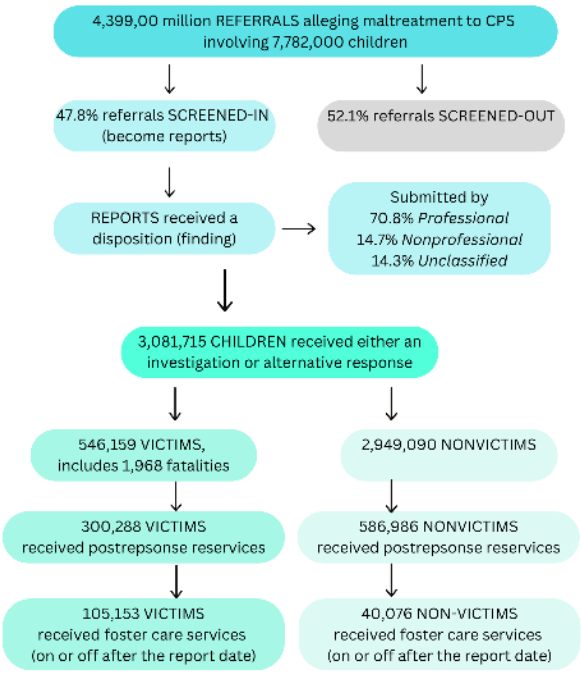


Figure **14.8.2**. How the Child Protective Services System Works. This figure illustrates the process by which a report of alleged maltreatment is processed through the CPS system. Statistics are from the U.S. Department of Health and Human Services, *Child Maltreatment Report 2023*. Image created by Heather Carter is licensed CC BY-NC-ND 4.0

For an accessible version, please use the provided Canva link.

Consequences of Maltreatment

Child maltreatment has long-term consequences that affect various aspects of a child's physical, psychological, and social development. Research indicates that experiencing abuse or neglect in childhood is associated with adverse health outcomes, including increased risk for chronic illnesses such as heart disease, diabetes, and obesity (Felitti et al., 1998; Gilbert et al., 2009). These health risks stem from prolonged exposure to toxic stress, which disrupts the development of critical biological systems, including the immune and nervous systems (Shonkoff et al., 2012).

Psychologically, maltreatment increases the likelihood of mental health disorders, including depression, anxiety, post-traumatic stress disorder (PTSD), and substance use disorders (Norman et al., 2012). Children who experience abuse often struggle with emotion regulation and have difficulty forming secure relationships, which can extend into adulthood and contribute to poor social functioning (Cicchetti & Toth, 2016). Maltreated children also demonstrate lower academic achievement and higher rates of school dropout due to difficulties with concentration, executive function, and behavior regulation (Lansford et al., 2002).



Figure 14.8.3. A young man with bruises on his hands. Image by cottonbro studio is licensed by Pexels.

Socially, the effects of maltreatment can persist into adulthood, impacting relationships and increasing the risk of future violence. The cycle of abuse hypothesis suggests that children who experience maltreatment are at a higher risk of becoming perpetrators or

victims of violence later in life (Widom et al., 2015). Additionally, individuals who were maltreated as children may struggle with employment stability and economic self-sufficiency, further exacerbating social inequalities (Currie & Widom, 2010).

Beyond individual consequences, child maltreatment has significant societal costs. The lifetime economic burden of child maltreatment in the United States has been estimated to exceed hundreds of billions of dollars annually due to healthcare costs, criminal justice involvement, and lost productivity (Peterson et al., 2018). Addressing child maltreatment through prevention, early intervention, and supportive services is essential to mitigating these lifelong consequences and improving outcomes for affected individuals.

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CHAPTER OVERVIEW

15: Cognitive Development in Early Childhood

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

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

15.1: Piaget’s Preoperational Intelligence

15.2: Vygotsky’s Sociocultural Theory of Cognitive Development

15.3: Information Processing

- 15.3.1: Attention
- 15.3.2: Memory
- 15.3.3: Executive Function
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15.1: Piaget's Preoperational Intelligence

Learning Objectives

1. Identify the key features of Piaget's preoperational stage and its typical age range.
2. Explain how symbolic thought is expressed through play, language, and drawing.
3. Describe intuitive thought and how it shapes young children's reasoning.
4. Define egocentrism.
5. Recognize examples of syncretism and animism in early thinking.
6. Explain why classification errors occur in young children.
7. Describe conservation and centration, and how they affect problem-solving.
8. Differentiate between assimilation and accommodation in cognitive development.

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, preoperational thought consists of two key features: the development of symbolic and intuitive thought. Let's examine some of Piaget's assertions about children's cognitive abilities at this age.

Use of Symbols

A defining characteristic of the preoperational stage is the ability to use symbols to represent objects, people, and events. Symbolic thought enables children to engage in pretend play, use language, and create drawings that reflect their understanding of the world.

- *Play:* Children use objects to represent other things, such as using a block as a telephone or pretending a doll is a real baby. "Some young children even create an imaginary friend, who is so real to them that they must have a seat and be served at the dinner table" (Levine & Munsch, 2024, p. 287).
- *Language:* The rapid expansion of vocabulary during early childhood is supported by the development of symbolic thought. Words become representations of objects and ideas, allowing children to communicate more effectively. For example, if we say the word "car", we no longer have to be in or next to the car to understand it exists.
- *Drawings:* Young children's artwork progresses from simple scribbles to more recognizable shapes, demonstrating their ability to use symbols to depict their environment and experiences. They also demonstrate the understanding that the picture is representative- because they do not try to eat a picture of an apple, but instead understand the picture represents a real apple (Preissler & Bloom, 2007).



Figure 15.1.1. A young girl is playing doctor with her teacher. Image by Yan Krukau is licensed by Pexels.

Intuitive Thought

As children continue developing cognitively, they *e*nter the intuitive thought substage (approximately ages 4 to 7). During this phase, children become more curious about their surroundings and begin to ask many "why" and "how" questions. However, their reasoning is often based on personal intuition rather than logical analysis.

Egocentrism

Egocentrism is a hallmark of Piaget's preoperational stage, referring to a child's inability to take another person's perspective. During early childhood, children struggle to recognize that others may have different viewpoints or emotions. This does not mean

they are selfish but rather that their cognitive development has not yet reached the stage where they can fully separate their own experiences from those of others (Piaget, 1951).

One of the classic studies illustrating egocentrism is Piaget's "Three Mountains Task," where children were asked to describe what a doll placed at a different vantage point could see. Preoperational children typically described the doll's view as identical to their own, demonstrating an egocentric perspective (Flavell, 1999). However, more recent research has questioned the rigidity of this concept. Studies using more familiar or relatable tasks have found that children as young as 3 or 4 years old can take another's perspective under certain conditions, suggesting that egocentrism may not be as absolute as Piaget initially proposed (Rubio-Fernández & Geurts, 2013).



Figure 15.1.2: Piaget's egocentrism experiment. Image by Rosenfeld Media is licensed under CC BY 2.0

Egocentric thinking can lead to difficulties in social interactions, as young children may not naturally understand how their actions impact others. For example, a child may grab a toy from a peer without realizing that the other child also has feelings about the toy. Because of this, it is crucial for caregivers and educators to establish clear boundaries and provide effective guidance. Modeling perspective-taking and encouraging children to consider others' emotions can help them gradually move beyond egocentrism (Brownell et al., 2013). Structured social experiences, such as cooperative play and storytelling, can also promote empathy and perspective-taking (Gleason, 2017).

Syncretism

Syncretism refers to the 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 make it 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 often depict objects that appear alive and possess lifelike qualities. Young children often seem to think that objects that move may be alive, but after the age of 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 of pizza. 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 compared to his sister's one piece, even though the total amount was the same. Keiko was able to consider several characteristics of an object rather 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 shown below, the child is presented with two glasses (as depicted in a), which are filled to the same level, and asked if they contain the same amount. Usually, the child agrees they have the same amount. The researcher then pours the liquid from one glass into 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] The same holds true for conservation of mass and number.

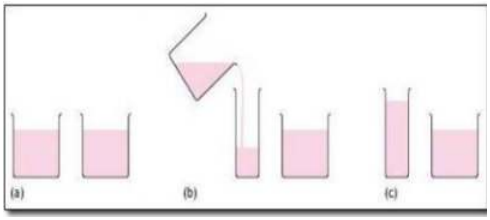


Figure 15.1.3a: Piagetian liquid conservation experiments. Image by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0



Figure **15.1.3**b: Piagetian conservation of mass. Image by Heather Carter (via Canva) is licensed under CC BY-NC-SA 3.0



Figure 15.1.3c: Piagetian conservation of numbers. Image by Heather Carter is licensed under CC BY-NC-SA 3.0

Working memory, or the ability to hold and manipulate information over short periods, also plays a role in conservation. Young children may grasp a concept momentarily but struggle to retain that understanding as they process new information. This limited working memory capacity makes it difficult for them to recall that the amount of water remained constant despite changes in appearance (Diamond, 2013).

As children grow, they develop the ability to decenter, meaning they can consider multiple aspects of a situation at once. Decentering enables more flexible thinking and is a crucial step in overcoming cognitive biases. Around the age of 6 or 7, children begin to succeed in conservation tasks as their cognitive abilities mature, allowing them to process multiple pieces of information simultaneously (Gelman, 2006).

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. However, when new experiences do not align with an existing schema, we use accommodation to incorporate a new schema. During early childhood, children often use accommodation as they build their understanding of the world around them.

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15.2: Vygotsky's Sociocultural Theory of Cognitive Development

Learning Objectives

1. Define the zone of proximal development (ZPD) and describe how scaffolding supports learning within it.
2. Differentiate between Piaget's and Vygotsky's interpretations of self-directed speech.
3. Compare Piaget's emphasis on discovery learning with Vygotsky's focus on guided instruction.

As introduced earlier in the text, Lev Vygotsky, a Russian psychologist, argued that culture has a significant 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 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. An effective parent, caregiver, or professional identifies a child's ZPD and helps the child learn within it. Then the adult 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.

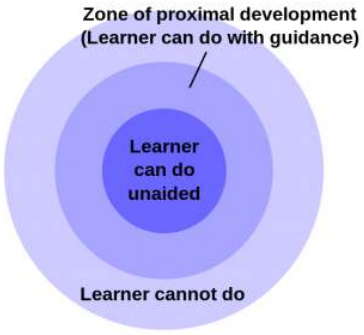


Figure 15.2.1: Zone of proximal development. Image by Dcoetzee is licensed under CC0 1.0

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 feeling 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 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,** 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). Furthermore, teachers may present abstract ideas without the child truly understanding them, and instead, they simply 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.

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SECTION OVERVIEW

15.3: 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).

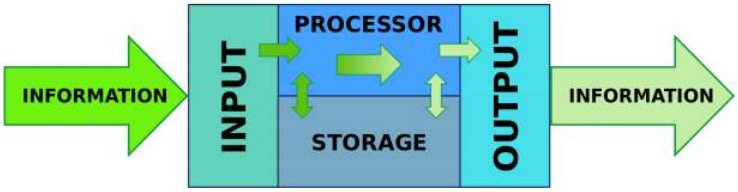


Figure 15.3.1: How information is processed. Image by Gradient drift is in the public domain.

Topic hierarchy

15.3.1: Attention

15.3.2: Memory

15.3.3: Executive Function

15.3.4: Social Cognition

References, Contributors and Attributions

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15.3.1: Attention

Learning Objectives

1. Describe the different types of attention.
2. Explain how temperament, task complexity, and sensory modality affect selective attention.
3. Summarize key research findings related to young children's attentional control.

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 referred to as **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 remain focused on a task for extended periods of time. Moreover, we also have attention processes that influence our behavior and enable us to inhibit a habitual or dominant response, as well as others that allow 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 to focus on selective attention tasks improves 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 attend to visual information selectively outpaced that of auditory stimuli. This may explain why young children struggle to hear the teacher's voice over the cacophony of sounds in a 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 similar to those of the target sound. In comparison, 8- to 11-year-old children often performed similarly to adults.



Figure 15.3.1.1: A group of children making crafts. Image by Joint Base Charleston is in the public domain.

Sustained Attention

Most measures of sustained attention typically ask children to spend several minutes focusing on one task while waiting for an infrequent event, despite the presence of 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. Still, they had to refrain from pushing the button when a non-target image was shown. The younger the child, the more difficulty they had maintaining their attention.



Figure 15.3.1.2: A child playing a game that measures her sustained attention. Image by Fabrice Florin is licensed under CC BY-SA 2.0.

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15.3.2: Memory

Learning Objectives

1. Identify and describe the three stages of memory.
2. Explain how memory capacities change and improve during early childhood.
3. Distinguish between declarative (semantic and episodic) and non-declarative memory.
4. Define infantile amnesia.
5. Describe memory strategies young children begin to use.
6. Recognize the role of social interaction and music in supporting memory development.

Stages of Memory

Stage 1: Sensory Memory

Based on studies of adults, people with amnesia, and neurological research on memory, researchers have proposed several "types" of memory. **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).

Stage 2: Working Memory

The second stage of the memory system is referred to as 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, which greatly diminishes their ability to juggle multiple pieces of information in memory consciously. 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 in active memory. This means that the more complex a mental task is, the less efficiently a younger child will be able to pay attention to and actively process information to complete the task.



Figure **15.3.2.1**: A child thinking. Image by Leonid Mamchenkov is licensed under CC BY 2.0.

Stage 3: Long-term Memory

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

- **Declarative memories**, also known as **explicit memories**, are memories of facts or events that we can consciously recall. 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.

Personal Narratives

Autobiographical memory is our personal narrative. Adults rarely remember events from the first few years of life due to infantile amnesia. **Infantile amnesia** refers to the phenomenon in which individuals are unable to recall autobiographical memories from early childhood, typically before the age of 3. This occurs due to the immaturity of brain structures, such as the hippocampus and prefrontal cortex, which are essential for memory formation and retrieval. As these brain regions develop and children acquire language and a sense of self, their ability to retain and recall personal experiences improves. By around age 3 to 4, children begin forming lasting episodic memories, although their ability to recall events continues to strengthen throughout early childhood.



Figure 15.3.2.2: When children share stories about themselves from their earliest years, infantile amnesia impacts how details are represented, causing them to make up information or draw on how they felt versus the details of the actual event. Image by Alliance for Excellence is licensed CC BY-NC 2.0.

Memory Strategies

While young children have remarkable recall for personally meaningful events, their ability to use deliberate memory strategies is still emerging. Two key strategies that support memory development in early childhood are **encoding** and **scripts**.

Encoding refers to the process of transforming information into a mental representation that can be stored and recalled later. Young children often rely on basic encoding strategies, such as repetition and visual cues, to aid in remembering information. This is more generally referred to as **rehearsal**, or repeating new words or facts to reinforce learning**.** As they grow, they begin to use more sophisticated techniques, such as **categorization**, where they group related items together to aid recall. For example, a preschooler learning about animals may remember them better by sorting them into categories such as pets, farm animals, zoo animals, or wild animals.

Scripts are structured representations of familiar events that help children remember and anticipate what will happen in routine situations. These mental frameworks allow children to store and retrieve information efficiently by filling in gaps based on past experiences. Young children rely on scripts to remember sequences of events, such as what typically happens during a birthday party or a bedtime routine. Because scripts provide a predictable structure, they help children recall details more easily. For example, a child who frequently visits a restaurant may expect to sit at a table, look at a menu, order food, eat, and then pay the bill.

The Role of Social Interaction

Parents and caregivers play a crucial role in shaping children's memory development. Through **elaborative reminiscing**, adults guide children in recalling past events by asking open-ended questions, encouraging them to provide details, and linking memories to emotions. This process enhances children's ability to organize and retrieve memories, resulting in richer and more coherent narratives.

Music is another means for creating memories. You probably remember the words to songs like "Old MacDonald," even though you likely haven't sung them in a long time. If you recall, in the song, children have to label animals and make their associated sounds. The connection between sound and memory is one reason we teach children using songs.

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15.3.3: Executive Function

Learning Objectives

1. Define executive function and explain its role in early childhood development.
2. Explain how executive function is assessed using tasks such as the Dimensional Change Card Sort (DCCS).

Changes in attention and the working memory system also involve changes in executive function. **Executive function** consists of cognitive processes that enable children to regulate their thoughts, behaviors, and emotions. These processes contribute to skills such as self-regulation, problem-solving, and adapting to new situations. Inhibitory control enables children to resist distractions and suppress impulsive behaviors, allowing them to remain focused on a task. For example, a child practicing inhibitory control might wait their turn instead of interrupting a conversation (Diamond, 2013). Developing inhibitory control can also be reinforced through spontaneous play, where children practice self-regulation by following game rules or taking turns.

Cognitive flexibility supports the ability to shift between tasks and perspectives, which is essential for adapting to changing environments and learning new concepts (Miyake & Friedman, 2012). One common assessment of cognitive flexibility is the Dimensional Change Card Sort (DCCS) test, where children are asked to sort cards based on one dimension (e.g., color) and then switch to sorting them by another dimension (e.g., shape). Young children often struggle with this shift, highlighting the gradual development of cognitive flexibility during early childhood.

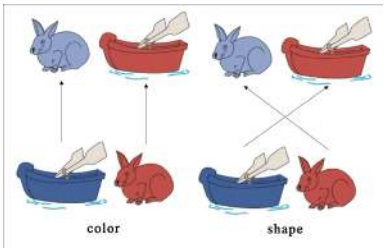


Figure **15.3.3.1**. Dimensional Change Card Sort (DCCS) task. (Zelazo, 2006).

The responsiveness of caregivers has a significant influence on the development of executive function. When caregivers provide a supportive and structured environment, children learn to manage their emotions, persist in challenging tasks, and regulate their behavior more effectively (Bernier, Carlson, & Whipple, 2010). Responsive caregiving involves providing consistent routines, encouraging problem-solving skills, and demonstrating self-regulation strategies. These interactions help children internalize executive function skills that are essential for success in school and social situations.

The development of executive function lays the groundwork for acquiring pre-academic skills. These cognitive abilities influence early literacy, numeracy, and social-emotional learning. For example, children with strong executive function skills can sustain attention during a story, follow multi-step instructions, and engage in cooperative play with peers. Supporting executive function in early childhood fosters the cognitive and social skills necessary for future academic success (Blair & Raver, 2015).

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15.3.4: Social Cognition

Learning Objectives

1. Describe the concept of theory-theory and how young children form explanations about the world.
2. Define theory of mind and explain how false belief tasks are used to assess its development.
3. Identify key components and the developmental sequence of theory of mind in early childhood.
4. Discuss cultural influences on theory of mind development and its role in social understanding.

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 questions 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 that begins to emerge in early childhood centers on the mental states, both their own and those of others.



Figure 15.3.4.1: What theories might this boy be creating? Image by Eglin Air Force Base is in the public domain.

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 15.3.4.2). 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, putting it inside a box. The child is then asked where Sally thinks the ball is located when she comes back to the room. Will she look first in the box or the basket?

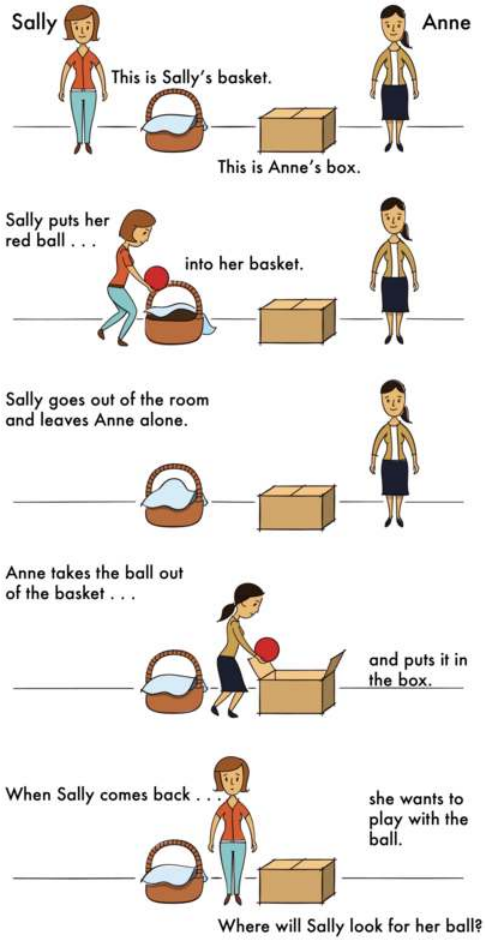


Figure 15.3.4.2: Salle-Anne task to test children's ability to infer false beliefs. Image by Bertram Malle is licensed CC BY-NC-SA 4.0

The correct 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.

This is particularly challenging for children under the age of four due to the cognitive effort required. Three-year-olds often struggle to distinguish between what they once believed to be 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 et. al, 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 et. al, 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 et al., 2006) suggest that theory of mind is comprised of several components, each with its own developmental timeline (see Table 15.3.4.1).

Table 15.3.4.1. Components of Theory of Mind (adapted from Lally & Valentine-French)

Component	Description
Diverse-desires	Understanding that two people may have different desires regarding the same object.
Diverse-beliefs	Understanding that two people may hold different beliefs about an object.
Knowledge access (knowledge/ignorance)	Understanding that people may or may not have access to information.
False belief	Understanding that someone might hold a belief based on false information.
Hidden emotion	Understanding that people may not always express their true emotions.

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 truly feel. In part, because children in early childhood have difficulty hiding their true feelings.

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 et. al, 2011). Shahaeian and colleagues (2011) suggested that cultural differences in child-rearing may account for this reversal. Parents in collectivistic cultures, such as China and Iran, emphasize conformity to 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 et al., 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 opinions, which could increase the risk of conflict when family members express their beliefs.



Figure 15.3.4.3: A family from a non-Western culture. Image by Giorgio Montersino is licensed under CC BY-SA 2.0.

As a result, children in individualistic cultures would acquire insight into the diversity of beliefs earlier. In contrast, 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 understanding false belief in children with siblings, especially older siblings (McAlister & Petersen, 2007; Perner et al., 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-aware that others may perceive us in different ways, and it encourages us to be understanding and empathetic toward others. Moreover, this mind-reading ability helps us to anticipate and predict people's actions. Awareness of others' mental states is crucial for effective communication and social skills. [21]

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15.4: Milestones of Cognitive Development

Learning Objectives

1. Identify cognitive development milestones by each age in the early childhood years.

The numerous theories of cognitive development and the various research studies conducted on how children understand the world have enabled researchers to examine the milestones typically experienced by developing children in early childhood. Here is a table that summarizes those.

Table **15.4.1**: Cognitive Developmental Milestones by the CDC is in the public domain.

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
4 years	• Names some colors and some numbers • 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 • Tells you what he thinks is going to happen next in a book
5 years	• Counts 10 or more things • Knows about things used every day, like money and food

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15.5: Play and Cognitive Development

Learning Objectives

1. Describe the cognitive and developmental benefits of play during early childhood.
2. Differentiate between discovery learning, guided play, and direct instruction.
3. Identify Piaget's sequence of play types and explain how they relate to cognitive growth.
4. Distinguish between the social levels of play and describe how social complexity evolves with development.

Play is Universal

Play is a fundamental and universal aspect of childhood that supports cognitive growth and problem-solving skills. Across cultures, children engage in various forms of play, from simple exploration to complex make-believe scenarios. Play is often characterized by its voluntary nature, intrinsic motivation, and emphasis on enjoyment rather than external rewards. Through play, children experiment with their environment, test ideas, and develop critical thinking skills.

Interaction of Play and Instruction

Discovery learning and **guided play** are two approaches that help children learn through hands-on exploration while maintaining structure and support. In **discovery learning**, children actively engage with materials and explore concepts independently, such as figuring out how blocks balance to build a tall tower. **Guided play** occurs when an adult subtly structures the activity while allowing the child to make choices. For example, a teacher might ask open-ended questions to encourage deeper thinking while children play with water and containers, thereby helping them understand concepts such as volume and measurement. These approaches contrast with direct instruction, where information is explicitly provided without room for exploration.

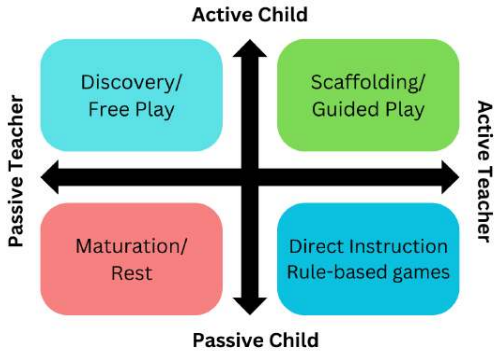


Figure 15.5.1. The interaction of play and direct instruction. Image by Heather Carter is licensed CC BY-NC-SA 4.0

Research suggests that play-based learning fosters better problem-solving and creativity compared to rigid, teacher-directed lessons (Weisberg, Hirsh-Pasek, & Golinkoff, 2016).

Development of Play

Sequence of Play

Piaget described a developmental sequence of play that reflects changes in cognitive abilities as children's thinking becomes more advanced.

1. In the early years, **functional play** (or practice play) involves simple, repetitive movements such as shaking a rattle or stacking cups.
2. As children grow, they engage in **constructive play**, where they build and create, such as assembling puzzles or forming structures with blocks.
3. By preschool age, **symbolic play** emerges, where children use objects to represent something else, like pretending a banana is a phone.

4. The most complex form is **games with rules**, where children follow structured guidelines, such as taking turns in a board game. These types of play build upon each other as children's thinking becomes more advanced (Piaget, 1962).

Symbolic or sociodramatic play, in which children assume roles and create narratives, is particularly valuable for cognitive and language development. When children pretend to be a doctor or a shopkeeper, they practice organizing thoughts, using new vocabulary, and understanding social roles. Engaging in pretend play has been linked to improvements in problem-solving, perspective-taking, and storytelling abilities (Lillard et al., 2013). Encouraging play-based learning in early childhood helps lay the foundation for academic success and lifelong curiosity.

Levels of Play

Play also varies in social complexity, referring to how children interact with others during play. As children age, play moves from more independent activities to cooperative interactions. However, even after a child has mastered a level of play, they may still be observed participating in any type of play that precedes that level.

1. Solitary play occurs when a child engages in activities alone, such as drawing or exploring toys independently.
2. Onlooker play occurs when a child watches others but does not participate.
3. Parallel play involves children playing near each other with similar materials, like two toddlers building with blocks side by side without interacting.
4. Associative play occurs when children engage in similar activities and interact, but maintain individual goals and interests.
5. Cooperative play emerges as social skills develop, with children engaging in shared activities, negotiating roles, and working toward common goals.



Figure **15.5.2**: A child pretending to buy items at a toy grocery store. Image by Ermalfaro is licensed under CC BY-SA 4.0.

According to Piaget, children's pretend play helps them solidify new cognitive schemes they are developing. 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).

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15.6: Language Development

Learning Objectives

1. Describe how children's vocabulary and sentence structure (syntax) develop in early childhood.
2. Distinguish between egocentric and private speech.
3. Identify common language development milestones from ages 3 to 5.
4. Explain how cultural and linguistic differences influence early language acquisition and understanding of figurative language.

Syntax Development

A child's vocabulary expands between the ages of 2 and 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 that are already familiar. This rapid growth in vocabulary influences the development of syntax. **Syntax** refers to the set of rules that govern how words are arranged to form meaningful sentences. In early childhood, children begin combining words into increasingly complex sentences, moving from simple two-word phrases (e.g., "want cookie") to more structured sentences with subjects, verbs, and objects.

While children across cultures follow a similar developmental pattern, cultural variations in sentence structure and word order influence how they acquire syntax. For example, English-speaking children typically develop subject-verb-object sentence structures early on, while children learning Japanese acquire different sentence patterns due to the language's verb-final structure (Slobin, 1997).

Overregularization

As children refine their understanding of syntax, they may overregularize grammatical rules. Overregularization occurs when children apply rules too broadly, such as saying "goed" instead of "went" or "tooths" instead of "teeth." This error demonstrates that children are not merely imitating language but are actively internalizing and applying grammatical rules. Although these mistakes seem like setbacks, they indicate significant cognitive progress in learning language structures (Pinker, 1999).



Figure 15.6.1: A woman instructing a girl on vocabulary. Image by the U.S. Department of the Interior is in the public domain.

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 that 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!"

Egocentric vs. Private Speech

Young children often engage in speech that is not directed at others, which Piaget (1959) referred to as *egocentric speech*. He believed this type of speech reflected children's limited ability to take another person's perspective, assuming that others understand their thoughts without explanation. This underpins Piaget's argument that children are not born social beings, and that they must learn to be social- their speech reflects their limited understanding until they become socialized. Piaget described speech development as follows:

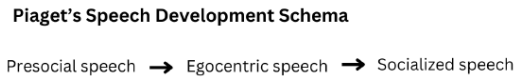


Figure 15.6.2a. Piaget's speech development schema. Image by Heather Carter is licensed CC BY-NC-SA 4.0.

Vygotsky (1978) argued, however, that egocentric speech is actually *private speech*, serving an important self-regulatory function rather than a social one. Private speech typically emerges as children attempt to solve problems or guide their own actions. For instance, a child trying to build a tower with blocks might mutter, “Put big one first… no, too wobbly… try again.” As children grow, private speech becomes more internalized and develops into inner speech, which supports self-directed thinking and problem-solving. Research indicates that private speech is particularly beneficial in challenging tasks, enabling children to focus their attention and regulate their behavior (Berk, 2006).

As children grow, private speech gradually becomes more internalized, transforming into *inner speech*, which eventually develops into silent *thought*. Rather than speaking aloud, children begin to subvocalize their thoughts, using internal dialogue to guide their actions. This transition reflects an increase in cognitive maturity and self-regulation. Studies suggest that private speech plays a key role in the development of executive functions, particularly in attention control and problem-solving (Aro et al., 2015).



Figure 15.6.2b. Vygotsky's speech development schema. Image by Heather Carter is licensed CC BY-NC-SA 4.0.

Vygotsky’s perspective on private speech has been widely supported by research, reinforcing the idea that language is fundamental to thought and learning. Unlike Piaget’s claim that egocentric speech fades as social awareness improves, studies show that private speech remains an essential part of cognitive processing well into adulthood, particularly when individuals face complex or novel tasks. By recognizing the importance of private speech, educators and caregivers can support children's self-directed learning and cognitive growth through rich language interactions and problem-solving opportunities.

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 15.6.1: Language Milestones Developmental Milestones by the CDC is in the public domain.

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 • 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
4 years	• 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” • Tells stories • Can say first and last name
5 years	• 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 examine the topic of pre-academics and its various applications.

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15.7: Pre-Academic Skills

Learning Objectives

1. Describe the components of emergent literacy.
2. Explain how dialogic reading and the PEER strategy promote early language and literacy skills.
3. Identify typical stages of early writing development.

Language development in early childhood plays a crucial role in acquiring pre-academic skills, particularly in reading, writing, and mathematics. Before children formally learn to read or write, they develop *emergent literacy*, which consists of foundational skills that prepare them for later academic success. Through early exposure to language and print, children begin to recognize the connections between spoken and written words, setting the stage for literacy and numeracy development.

Pre-Reading Skills

Emergent literacy includes early experiences with books, storytelling, and environmental print (such as signs and labels), which help children develop an awareness of written language. One essential pre-reading skill is **phonemic awareness**, the ability to recognize and manipulate the sounds within words. For example, a child who can hear that “cat” and “bat” rhyme or break “dog” into the sounds /d/, /o/, and /g/ is demonstrating phonemic awareness, which is a strong predictor of later reading success (Lonigan et al., 2009). Phonemic awareness is closely tied to **phonics**, the understanding that letters represent sounds, which allows children to decode written words.

Dialogic Reading and the PEER Strategy

One evidence-based approach to supporting emergent literacy is **dialogic reading**, a technique grounded in Vygotsky’s theory that learning occurs through social interaction. Dialogic reading involves an adult engaging a child in a conversation about a book, rather than simply reading aloud to them. Instead of being passive listeners, children become active participants, responding to prompts, answering questions, and making predictions about the story as it unfolds. Research shows that dialogic reading improves vocabulary, comprehension, and expressive language skills, particularly for children from diverse backgrounds (Mol et al., 2008).

A widely used method within the dialogic reading is the PEER strategy. During the PEER strategy, the adult:

1. *Prompts* the child with a question about the book (e.g., "What do you think will happen next?").
2. The adult then *evaluates* the child's response (e.g., "Yes, the dog is looking for his bone.")
3. and *expands* what the child said (e.g., "He looks worried because he can't find it.").
4. Finally, the adult *repeats* the prompt to reinforce learning (e.g,. "Where do you think the bone might be?").

Several types of prompts may be used to engage children in dialogic reading through the PEER strategy.

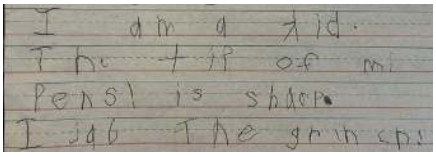
Table **15.7.1**. Types of prompts used with the PEER strategy.

Prompt	Description	Example	Goal of the prompt
Completion questions	Encourage children to finish a sentence or phrase from the book.	When reading *Brown Bear, Brown Bear, What Do You See?*, a caregiver might pause and let the child complete the phrase: "I see a red _____ looking at me."	Help children focus on sentence structure and familiar patterns.
Recall questions	Ask children to remember details from the book.	A caregiver might ask, "What happened to the caterpillar before it became a butterfly?" in *The Very Hungry Caterpillar*.	Strengthen memory and comprehension.
Open-ended questions	Encourage children to express their thoughts and expand on ideas.	Instead of asking, "Is the girl happy?" an adult might ask, "How do you think she feels, and why?"	Promote conversation and deeper thinking.
Wh- questions	Focus on who, what, where, when, and why.	When reading *Where the Wild Things Are*, a caregiver might ask, "Why did Max's mother send him to his room?"	Help develop reasoning skills and comprehension.
Distancing prompts	Connect the story to the child's real-life experiences.	If reading a book about animals, an adult might ask, "Have you ever seen a dog like this before? Where did you see it?"	Encourage children to make connections between books and their own world, which enhances engagement and understanding.

Learning to Write

As children's language skills grow, they begin to express themselves through writing. Early writing starts with scribbles and letter-like shapes before evolving into recognizable letters and words. One of the first steps in writing development is *invented spelling*, where children attempt to write words based on their phonetic understanding. For instance, a child might write "CT" for "cat," demonstrating their awareness of letter-sound relationships (Puranik & Lonigan, 2011). Encouraging children to engage in writing activities, such as drawing stories, labeling pictures, or dictating sentences to adults, strengthens their ability to communicate through written language.

Table 15.7.2. Basic stages of writing, description, and examples.

Stage of Writing	Description	Example
Pre-Emergent writing (scribbling and drawing)	Children explore making marks on paper. The goal is to develop fine motor skills and understanding of the symbolic nature of writing.	 Figure **15.7.1**a. Controlled, directional scribbling and drawing in purple and pink markers. Image by Heather Carter is licensed CC BY-SA 4.0.
Emergent writing	Children begin to recognize and attempt to form letters. May start to write simple words or sentences, but not in a conventional manner.	 Figure **15.7.1**b. Mock letters of N, B, and indiscriminate in purple and pink markers. Image by Heather Carter is licensed CC BY-SA 4.0.
Transitional writing	Children use knowledge of letters and sounds to spell words phonetically. Sometimes, spelling is invented. Begins to show an understanding of basic sentence structure.	 Figure **15.7.1**c. "I am a kid. The tip of my pencil is sharp. I jab the Grinch!". Image by Heather Carter is licensed CC BY-SA 4.0.
Fluent writing	Includes conventional spelling, grammar, and punctuation. Children can produce longer, more complex texts.	 Figure **15.7.1**d. "HAPPY Birthday Ben". Image by Heather Carter is licensed CC BY-SA 4.0.

Mathematics

Just as language supports literacy, it also provides the foundation for early numeracy. Before children formally learn arithmetic, they develop an understanding of numbers through everyday experiences, such as counting objects, recognizing patterns, and comparing quantities. **Number sense**, the ability to understand and manipulate numbers, emerges in early childhood and is crucial for later mathematical achievement. For example, a child who understands that “four” represents a specific quantity, regardless of whether it refers to four apples or four blocks, is demonstrating number sense (Jordan et al., 2009).

Children also develop early arithmetic skills through *one-to-one correspondence* (matching objects to numbers), *cardinality* (understanding that the last number in a count represents the total amount), and *subitizing* (recognizing small quantities without counting). Just as dialogic reading promotes literacy, engaging children in conversations about numbers—such as asking them to count objects in a book or compare quantities in a grocery store—enhances their mathematical thinking.

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15.8: Promoting Cognitive and Language Development

Learning Objectives

1. Describe key strategies that promote cognitive and language development.
2. Explain the role of early childhood education programs, such as Head Start, in supporting school readiness and long-term outcomes.
3. Identify risk factors that may hinder cognitive and language development

Cognitive and language development in early childhood is influenced by a variety of factors, including environmental stimulation, caregiver interaction, and access to enriching experiences. While many factors can support a child's growth in these areas, some risks can hinder development. Understanding both the supportive and risk factors can help caregivers and educators create environments that foster optimal learning.

Promoting Cognitive and Language Development

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 in their language use. One of the most effective ways to support language growth is through *responsive interactions*. Engaging in back-and-forth conversations, expanding on children's statements, and asking open-ended questions helps enrich vocabulary and sentence structure. For example, if a child says, "Dog run," a caregiver might respond, "Yes, the big brown dog is running really fast!" This expansion provides a model for more complex syntax and supports the scaffolding process.

Reading aloud is another powerful tool for language development. Books expose children to new vocabulary, diverse sentence structures, and storytelling conventions. Research indicates that shared reading experiences contribute to stronger language skills, particularly when caregivers engage children in discussions about the story (Mol et al., 2008).



Figure 15.8.1. An adult reading a book with children. Image by Ksenia Chernaya is licensed by Pexels.

Additionally, play-based interactions encourage language development. Pretend play, in particular, prompts children to use more advanced language as they negotiate roles, create storylines, and express ideas. Conversations during play support vocabulary growth and enhance communication skills (Weisberg et al., 2013).

Physical and emotional well-being also impact development. Proper nutrition, consistent sleep routines, and a stress-free environment provide a foundation for learning. Positive emotional support from caregivers, including responsive and sensitive interactions, fosters a secure attachment that encourages children to explore and learn with confidence (Bernier et al., 2010).

The Role of Early Childhood Education

Preschool education provides children with foundational skills in language, literacy, numeracy, and social interaction. Studies indicate that children who attend high-quality preschool programs demonstrate stronger pre-reading and math skills compared to peers who do not (Duncan et al., 2007). These early academic advantages can set the stage for success in elementary school and beyond.

In addition to academic benefits, preschool programs support the development of executive functioning skills. Research has shown that children who attend preschool are better prepared to follow instructions, engage in cooperative learning, and navigate

classroom expectations (Blair & Raver, 2015). These skills contribute to smoother transitions into kindergarten and higher overall academic achievement.

Head Start

Head Start was launched in 1965 as part of President Lyndon B. Johnson's War on Poverty. The program was designed to provide comprehensive early childhood education, health, and nutrition services to low-income children and their families. Since its inception, Head Start has served millions of children across the United States, aiming to reduce educational disparities and promote school readiness.

Research on the effectiveness of Head Start has yielded mixed results; however, overall, studies suggest positive short-term and long-term benefits. The Head Start Impact Study (U.S. Department of Health & Human Services, 2010) found that children enrolled in Head Start demonstrated early gains in language and literacy skills, as well as improved social and emotional development. However, some of these academic advantages appeared to fade by third grade, a phenomenon known as the "fade-out effect." Despite this, other research suggests that Head Start participants experience lasting benefits in adulthood, including higher rates of high school and college completion, better health outcomes, and lower involvement in crime (Deming, 2009).



Figure 15.8.2. Children from the Head Start program enjoy a day full of fun activities at the New River Trail. Image by Virgina State Parks is licensed CC BY 2.0.

One key factor influencing the effectiveness of Head Start is program quality. When Head Start centers maintain high standards for teacher training, curriculum design, and classroom interaction, children demonstrate greater long-term benefits. Additionally, family engagement plays a critical role in the program's success. Head Start encourages parent involvement through workshops, home visits, and support services, reinforcing learning at home and strengthening the parent-child relationship (Yoshikawa et al., 2013).

Long-Term Outcomes of Early Education

The long-term advantages of early childhood education extend beyond academic achievement. Studies show that individuals who attended high-quality early education programs are:

- More likely to be employed, earn higher wages, and contribute positively to society (Heckman et al., 2010).
  - The HighScope Perry Preschool Study, which tracked participants for over 40 years, found that children who attended high-quality preschool programs had higher high school graduation rates, increased earnings, and lower rates of incarceration compared to those who did not attend (Schweinhart et al., 2005).
- Experience reduced rates of special education placement and grade retention, which can result in cost savings for public education systems (Barnett, 2011).
- Promotes better health. Participants in early education programs are more likely to engage in preventive healthcare, have better nutrition habits, and experience lower rates of chronic diseases in adulthood (Campbell et al., 2014).

Risk Factors

Poverty

Several risk factors can negatively impact cognitive and language development in early childhood. One of the most significant is poverty, which can limit access to educational resources, high-quality childcare, and enriching experiences (Fernald et al., 2013).

Children from low-income backgrounds may have less exposure to books, complex language, and stimulating conversations, which can contribute to vocabulary and literacy gaps by the time they enter school.

Even before children 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.



Figure 15.8.3. A variation of Chutes and Ladders is called Snakes and Ladders. Image by Jacqui Brown is licensed CC BY-SA 2.0.

Chutes and Ladders is a game with a number in each square; children start at number one and spin a spinner or throw a die to determine how far to move their token. 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.

Adverse Childhood Experiences

Chronic stress and adverse childhood experiences (ACEs), such as neglect, abuse, or household instability, can impair cognitive development by affecting brain structures involved in learning and memory (Shonkoff & Garner, 2012). Children exposed to high levels of stress may struggle with attention, self-regulation, and language processing.

Limited caregiver interaction also poses a risk to language development. Children who experience fewer verbal exchanges with adults may develop smaller vocabularies and weaker language comprehension skills (Hart & Risley, 1995). Excessive screen time, if used without interactive engagement, can replace valuable face-to-face communication and hinder language acquisition (Madigan et al., 2020).

Impairments and Developmental Delays

Hearing impairments, speech delays, and neurodevelopmental disorders such as autism spectrum disorder (ASD) can also affect language development. Early identification and intervention, including speech therapy and language-rich environments, can help mitigate some of these challenges and support a child's progress (Tager-Flusberg et al., 2009).

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CHAPTER OVERVIEW

16: Social Emotional Development in Early Childhood

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

16.1: Emotional Development
16.2: Development of Self
16.2.1: Personality
16.2.2: Gender Identity, Constancy and Roles
16.3: Social Development
16.4: Morale Development
16.5: Social and Emotional Milestones
16.6: Family Dynamics
16.7: Peers and Play
16.7.1: Play
16.8: Stress, Risks and Resilience

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16.1: Emotional Development

Learning Objectives

1. In relationship to Erikson's stage of initiative vs. guilt, describe how caregiver responses influence a child's confidence and independence.
2. Differentiate guilt from shame and explain their impact on children's emotional development.
3. Explain the development of emotional regulation.
4. Identify strategies caregivers can use to support emotional understanding and control.

Erikson's Initiative vs. Guilt Stage

Psychologist Erik Erikson argues that children in early childhood go through a stage of "initiative vs. guilt". The previous stage of trust and autonomy develops into a desire to take initiative, think of ideas, and take action. 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. Erikson's stage of initiative versus guilt highlights the importance of emotional experiences in shaping children's sense of confidence and independence.

For example, children may want to build a fort with the cushions from the living room couch, open a lemonade stand in the driveway, or make a zoo with their stuffed animals and issue tickets to those who want to come. 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 pale in comparison to the smiling face of a five-year-old who emerges from the bathroom with clean teeth and pajamas! [8]



Figure 16.1.1: Children playing in the sand. Image is in the public domain.

Secondary Emotions

One important aspect of emotional development is the distinction between primary and secondary emotions. Primary emotions, such as happiness and fear, are present early in life and are understood by young children with increasing accuracy. By the age of five, children can recognize and interpret emotions at levels similar to those of adults (Rodger et al., 2015). However, secondary emotions (including pride, guilt, shame, jealousy, etc.) require a more nuanced understanding of oneself and social expectations, and they take longer to develop (Park & Lewis, 2021). These secondary emotions emerge in toddlerhood, but increase drastically in early childhood as children gain awareness of societal standards and begin to evaluate their own actions in relation to those expectations.

Guilt and shame are often confused, but have distinct developmental and psychological implications. Guilt arises when a child recognizes that they have done something wrong and feels motivated to repair the situation or change their behavior. It is associated with feelings of remorse and a desire to make amends. In contrast, shame is a more global emotion, in which the child perceives themselves as inherently bad or unworthy, rather than focusing on a specific action (Tangney et al., 2007). While guilt can encourage positive moral development and prosocial behavior, excessive shame can lead to withdrawal, low self-esteem, and difficulty forming secure relationships. Research suggests that guilt typically emerges in early childhood as children begin to understand cause and effect in their actions. In contrast, shame develops later as self-awareness and social comparison become more pronounced (Lewis, 2016).

Emotional Regulation

As children navigate these emotional experiences, they also develop emotional regulation skills, which involve managing their emotional responses to various situations and events. **Emotional regulation** is crucial for both social success and academic readiness. It encompasses the ability to control impulses, adjust emotional intensity, and respond appropriately to social cues. Caregivers play a key role in fostering these skills by modeling healthy emotional expression, providing a supportive environment, and teaching strategies such as labeling emotions, using calming techniques, and encouraging problem-solving (Thompson, 2019). When children are able to talk about their feelings, they can both experience and express their feelings in less extreme ways, thus reducing the likelihood of temper tantrums.

Responsive caregiving also helps children develop **emotional intelligence**, which refers to the ability to recognize, understand, and manage one's own emotions while also responding to the emotions of others (Denham, Bassett, & Zinsser, 2019). Strong emotional intelligence in early childhood is associated with improved social relationships, enhanced academic achievement, and better overall mental health in later years.

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SECTION OVERVIEW

16.2: Development of Self

Learning Objectives

1. Explain how self-concept develops in early childhood through social interaction.
2. Describe the role of self-control in early childhood development.
3. Analyze the relationship between play and self-regulation.

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

Theories

Cooley & The Looking-Glass Self

Charles Horton Cooley (1964) suggests that our self-concept is shaped by observing how others respond to us. This process, known as the **looking-glass self,** involves observing how others perceive us and interpreting this as we make judgments about our own qualities, such as being 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 16.2.1: A child looking at herself wearing glasses in a mirror. Image is in the public domain.

Mead & "I/Me"

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 themselves and say aloud, “No, that’s bad” while patting his own hand. What has happened? The child can see himself through the eyes of the mother. As the child grows and is exposed to various cultural situations and norms, they begin to view themselves through the eyes of others, shaped by these cultural norms. This is referred to as “taking the role of the generalized other” and results in a sense of self with many dimensions. The child develops a sense of self as a student, a friend, a son, and so on.

Exaggerated Sense of Self

One way to gain a clearer sense of self is to exaggerate those qualities that you want to incorporate into yourself. Preschoolers often like to exaggerate their 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-Concept & Self-Esteem

Early childhood is a time of forming an initial sense of self. **Self-concept** refers to our self-description in various categories, including both external and internal qualities. These can include physical characteristics, possessions, abilities, feelings, and other basic information (e.g., a child's age or where they live). As children age, their self-concept will change. **Autobiographical memories**, also known as coherent memories, begin to develop in early childhood and can significantly impact a child's self-concept. When parents and caregivers guide children in complex discussions about events, children remember details and understand them in more complex ways, which contributes to more accurate memories and influences how children describe themselves (Prebble et al., 2013).

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 that of a 3-year-old girl with red hair who enjoys playing 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 open-ended questions, as they felt that language limitations hindered 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 et.al, 2008) and often give similar responses to what others (parents and teachers) say about the child (Brown et.al, 2008; Colwell & Lindsey, 2003).



Figure 16.2.2: Young children don’t always feel good about themselves. Image by Lisa Runnels is licensed CC0.

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 et al., 1980), as well as a comparison between what the child once could do and 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). Goodwin and her colleagues also found that maternal negative affect (emotional state) produces more negative self-evaluations in preschool children.

Self-Control

Self-control is not a single phenomenon, but rather a multifaceted one. 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 et. al, 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 et. al, 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 et. al, 2015). [5]

Self-Control and Play

Thanks to the new Centre for Research on Play in Education, Development and Learning (PEDaL), Zhao, Whitebread, Baker, Gibson, and a team of researchers (2019) aim to provide evidence on the role played by play in a child's development.

“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 more quickly when exploring an unfamiliar setup 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, as the researchers suggest, it could be extremely significant for educational practices, because the ability to self-regulate is 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]

Topic hierarchy

16.2.1: Personality

16.2.2: Gender Identity, Constancy and Roles

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16.2.1: Personality

Learning Objectives

1. Examine how temperament serves as a foundation for the development of personality.
2. Analyze the role of biological and environmental influences on 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 influenced, for example, by the level of support in 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 et. al, 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 who cries frequently doesn't necessarily have a grumpy personality. With sufficient parental support and increased sense of security, the child may develop into a contented preschooler who is not likely to cry to get her needs met.



Figure 16.2.1.1: A girl enjoying nature. Image by Khanh Steven on Unsplash.

In addition, personality is composed of many other features beyond 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 in personality. Biological dispositions influence these qualities, 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.

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16.2.2: Gender Identity, Constancy and Roles

Learning Objectives

1. Analyze the role of biological, psychological, and social influences in the development of gender identity and gender roles in early childhood.

Gender identity refers to an individual's internal sense of being male, female, or another gender, which may or may not align with their biological sex (American Psychological Association [APA], 2021). In early childhood, gender identity begins to emerge as children recognize gender differences and start categorizing themselves and others within societal gender roles. By the age of two, most children can identify themselves as a boy or a girl, and by preschool age, they develop a deeper interest in gender-related behaviors and societal expectations (Martin & Ruble, 2004).

Historical Perspectives

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. Still, after recognizing 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 their 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 often push their sons away too soon, directing 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 16.2.2.1: A boy showing independence and confidence. Image by Adam Jones is licensed under CC BY-SA 2.0.



Figure 16.2.2.2: A girl showing dependence and comfort within a relationship. Image by Sai De Silva is licensed CC0.

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 can refine and modify their sense of self based on their gender.

Current Perspectives

Behaviorism and Social Learning Theory

From a behaviorist perspective, gender identity is shaped through reinforcement and modeling. Social learning theory (Bandura, 1986) suggests that children learn gender-appropriate behaviors by observing and imitating the behaviors of parents, teachers, friends, peers, schools, religious institutions, media, and others. Reinforcement plays a crucial role, as behaviors that align with gender norms are often rewarded, while those that deviate may be discouraged (Bussey & Bandura, 1999). For example, a boy praised for playing with trucks but discouraged from playing with dolls internalizes societal expectations of gender.

Social Cognitive Theory

Social cognitive theory builds upon social learning by emphasizing cognitive processes, including attention, retention, and motivation (Bussey & Bandura, 1999). Children actively engage with their environments, selecting role models and internalizing gender norms based on observed rewards and punishments. This perspective highlights how media, culture, and personal agency interact to shape gender identity over time.

Cognitive Developmental Theory

Cognitive developmental theory (Kohlberg, 1966) posits that children actively construct their understanding of gender in a series of stages.

1. First, they develop **gender identity** (awareness of being male or female),
2. followed by **gender stability** (understanding that gender remains consistent over time), and
3. finally, **gender constancy** (realization that gender is invariant despite changes in appearance or activities). This theory suggests that as cognitive abilities mature, children become increasingly motivated to adhere to gender norms.

Gender Schema Theory

Gender schema theory (Bem, 1981; Martin & Halverson, 1981) suggests that children develop mental frameworks, or schemas, that guide their understanding of gender roles. These schemas influence how they interpret information, shaping their preferences and behaviors. For instance, a child who perceives certain toys as "for boys" or "for girls" will selectively engage with activities that align with their gender schema.

Gender Self-Socialization Model

The gender self-socialization model (Tobin et al., 2010) integrates cognitive and social influences, emphasizing how children actively participate in shaping their gender identity, which includes their thoughts and feelings about belonging to a particular gender. Rather than passively absorbing societal norms, children interpret gender cues based on personal motivations, social feedback, and their developing self-concept. This model explains why some children rigidly adhere to traditional gender norms, while others exhibit greater flexibility in their gender expression.

Tobin and researchers describe five dimensions of gender identity:

1. Membership knowledge- a child's awareness and understanding of their gender category (e.g., knowing they are a boy or a girl).
2. Gender typicality- the extent to which a child perceives themselves as similar to others of the same gender traits, behaviors, and/or preferences.
3. Gender contentment - satisfaction with the assigned gender and how comfortable the child feels within that identity.
4. Felt pressure to gender conformity- the degree to which a child experiences external and internal pressure to adhere to traditional gender norms.
5. Intergroup bias- expectations experienced from self and others for adhering to gender stereotypes (Tobin et.al, 2010, p. 608).

In the United States, there are stereotypes that boys should be strong, forceful, active, dominant, and rational, and that girls should be pretty, subordinate, unintelligent, emotional, and gabby. Often, these stereotypes are portrayed in children's toys, books, commercials, video games, movies, television shows, and music. While media and marketing are making attempts to shift away from this, unfortunately, it still exists.



Figure 16.2.2.3: Store shelves filled with pink and purple colors and girls' toys. Image by Janet McKnight is licensed under CC BY 2.0.



Figure 16.2.2.4: Store shelves filled with primary colors and boys' toys. Image by Janet McKnight is licensed under CC BY 2.0.

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]

Intersectionality and Gender Identity Development

Intersectionality, a concept introduced by Crenshaw (1989), acknowledges that gender identity does not exist in isolation but is shaped by overlapping social identities, including race, ethnicity, socioeconomic status, and disability. Children's experiences of gender can vary widely depending on cultural norms and societal expectations within different communities.

For example, research indicates that Black and Latinx children may experience unique gendered socialization processes influenced by family values, cultural traditions, and systemic biases (Rogers et al., 2021). Similarly, children with disabilities may encounter different expectations regarding gender expression and identity due to societal perceptions of ability and independence (Goodley, 2016). Understanding gender development through an intersectional lens allows educators and caregivers to create more inclusive environments that recognize and affirm diverse gender experiences.

Transgender Identity in Early Childhood

For some children, gender identity does not align with their biological sex, leading to what is now recognized as transgender identity. Research indicates that transgender children, even in early childhood, often express a consistent, insistent, and persistent identification with a gender different from their assigned sex at birth (Olson et al., 2015). Gender dysphoria, the distress associated with this incongruence, can emerge early, with some children expressing discomfort with gendered expectations by age three or four (APA, 2021).

Supportive parenting and affirming environments play a crucial role in the well-being of transgender children. Studies suggest that children allowed to express their gender identity freely experience lower levels of anxiety and depression compared to those who face rejection or pressure to conform (Durwood, McLaughlin, & Olson, 2017). Ongoing research continues to explore the complex interplay between biological, cognitive, and social factors in transgender identity development.

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16.3: Social Development

Learning Objectives

1. Explain how relationships contribute to social development in early childhood.
2. Identify key mechanisms for social understanding.

Developing Social Understanding

Children's relationships at home and within peer groups significantly shape their social and emotional development. Through these relationships, children form expectations for specific individuals, develop an understanding of appropriate interactions with adults and peers, and construct a self-concept based on how others respond to them. These social connections serve as key contexts for emotional growth and cognitive development.

Even in infancy, children demonstrate an awareness that others have mental states—such as perceptions, emotions, and desires—that influence behavior and may differ from their own. Experimental research indicates that by late preschool years, children understand that beliefs can be mistaken, that memories influence emotions, and that emotions can be concealed from others (Wellman, 2011). This growing social understanding is closely linked to advancements in theory of mind—the ability to attribute mental states to oneself and others.



Figure 16.3.1. Music and movement is a good tool to help children learn about others, as well as themselves. Image is licensed CC BY-NC 4.0.

Mechanisms of Social Understanding

Young children develop social understanding through keen observation of others, drawing inferences from emotional expressions, language, and behavior. For instance, children learn that what their caregiver is looking at may reflect their thoughts or intentions (Gopnik, Meltzoff, & Kuhl, 2001). This ability is particularly pronounced in relationships with familiar caregivers, aligning with the principles of attachment theory.

Language development plays a vital role in refining social understanding, as children gain words to describe mental states (e.g., "happy," "angry") and engage in conversations that reinforce these concepts. Parents contribute to this process by discussing mental states explicitly, helping children connect emotions to experiences. For example, statements like "Your sister was sad because she thought Daddy was coming home" scaffold children's comprehension of emotions and false beliefs (Thompson, 2006b).

Some researchers propose that infants possess an innate ability to perceive people as entities with internal mental lives, which helps them interpret behavior in terms of underlying thoughts and emotions (Leslie, 1994). This biological preparedness may serve as a foundation upon which early experiences and interactions build an increasingly sophisticated social cognition.

Prosocial Behaviors

Prosocial behaviors are voluntary actions intended to benefit others, such as helping, sharing, comforting, donating, volunteering, and cooperating. In early childhood, these behaviors begin to emerge more consistently as children's social and emotional understanding becomes more advanced. Around the ages of 2 to 3, children may start to show empathy-based responses, such as

offering a toy to a peer who is upset or attempting to comfort someone who is crying. These early behaviors are often modeled after and encouraged by adult responses, particularly those of caregivers, who play a vital role in promoting prosocial development (Eisenberg, Spinrad, & Knafo-Noam, 2015).



Figure **16.3.2**. A preschool boy engages in prosocial behavior by helping a classmate put her sandal back on. Image by Heather Carter is licensed CC BY-NC-SA 4.0.

As children's cognitive abilities mature, they become better able to take the perspective of others and understand emotions, both of which are foundational for prosocial development. Emotion understanding enables children to recognize when others are in need, while perspective-taking helps them respond appropriately. Research has shown that children who demonstrate greater emotional regulation and empathy are also more likely to engage in helping and cooperative behaviors with peers (Brownell, 2013). For example, preschoolers who can manage their own emotional responses during conflict are better equipped to resolve disputes in ways that maintain positive peer relationships.

Prosocial behavior in early childhood is also influenced by temperament, parenting style, and the social context in which the child is raised. Children who experience warm and responsive caregiving are more likely to exhibit concern for others and demonstrate helping behaviors (Kochanska, 2002). Additionally, peer interactions during play provide important opportunities to practice sharing, negotiation, problem-solving, and turn-taking. These repeated social exchanges contribute to children's growing understanding of fairness, empathy, and cooperation.

Studies have linked early prosocial behavior to later academic success, social competence, and even mental health outcomes (Caputi, Lecce, Pagnin, & Banerjee, 2012). Adults can foster prosocial tendencies by modeling kindness, labeling emotions, encouraging problem-solving, and reinforcing caring behaviors. As children develop a sense of moral reasoning and emotional understanding, their capacity for prosocial action deepens, forming an important part of their social-emotional competence.

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16.4: Morale Development

Learning Objectives

1. Define moral development and explain how it is influenced by social, emotional, and cognitive factors in early childhood.
2. Describe how parenting style, peer interaction, and cultural values shape children's moral understanding and behavior.
3. Explain the role of empathy, conscience, and emotional regulation in guiding moral actions.
4. Distinguish between moral rules and social conventions.
5. D escribe how cognitive development supports moral reasoning and moral identity.

Moral development in early childhood is a complex process influenced by social experiences, emotional growth, and cognitive abilities. It involves the development of **conscience**, the ability to distinguish right from wrong, and the motivation to act in accordance with moral values. This process is shaped by interactions with caregivers, peers, and cultural expectations, as well as the child's emerging emotional regulation and cognitive understanding of morality.

Role of the Environment

The environment plays a crucial role in shaping children's moral values and behaviors. Social interactions with parents, caregivers, teachers, and peers provide the foundation for understanding moral expectations and internalizing ethical standards.

- Warm, responsive parenting fosters a mutually responsive relationship, where children are motivated to follow moral guidelines out of trust and respect rather than fear.
- Positive discipline techniques, such as reasoning and explanation, help children internalize moral principles, whereas harsh punishment can lead to compliance out of fear rather than accurate understanding (Gershoff et al., 2018).
- Interactions with peers provide opportunities to practice fairness, cooperation, and perspective-taking.
  - Through play, children learn to navigate conflicts, negotiate rules, and develop a sense of justice (Killen & Smetana, 2015).
  - Moral lessons often emerge naturally in social interactions, such as when a child realizes that taking turns leads to more enjoyable play experiences.
- Additionally, moral values are shaped by cultural beliefs and societal norms.
  - Some cultures emphasize collective responsibility and obedience, while others prioritize individual autonomy and fairness (Rogoff, 2003). Children absorb these cultural norms through interactions with their family, schools, and media, which shape their moral reasoning and behaviors.

Role of Emotional Development

Emotional development plays a fundamental role in moral behavior. Children's ability to regulate emotions, experience empathy, and develop a sense of guilt or pride influences their moral decisions and actions. **Empathy**—the ability to understand and share another's emotions—drives helping, sharing, and comforting behaviors (Eisenberg, Spinrad, & Eggum, 2010). By age three or four, children begin to show genuine concern for others and engage in simple acts of kindness, such as offering a toy to a crying friend.

The development of empathy is linked to secure attachments with caregivers and exposure to emotionally supportive environments. The emergence of conscience lays a crucial foundation for moral behavior. Children begin to internalize moral values and feel guilt or discomfort when they violate these standards (Thompson, 2012). This self-regulation is crucial for moral development, as it motivates children to act following moral principles even when no one is watching. Moral dilemmas often involve balancing selfish impulses with ethical choices. For example, resisting the urge to grab a toy from a peer requires effortful control—a self-regulation skill that develops during early childhood (Kochanska et al., 2015). Children with strong emotional regulation are better able to manage frustration and make moral choices based on fairness rather than immediate gratification.



Figure 16.4.1: This child might be experiencing a guilty conscience. Image by George Hodan is in the public domain.

Role of Cognitive Development

Cognitive development enables children to comprehend moral principles, fairness, and intentions. As children's thinking skills mature, so does their ability to reason about moral issues. Young children begin to differentiate between moral rules (e.g., "Hitting is wrong") and social conventions (e.g., "We eat with a spoon"). By the age of four or five, children recognize that moral rules are universally important, whereas social conventions vary across cultures (Turiel, 2006). This distinction helps children understand why certain behaviors are wrong, regardless of the context.

As children's theory of mind develops, they become better at recognizing others' thoughts and feelings (Wellman, 2011). This ability allows them to engage in more complex moral reasoning, such as considering intentions behind actions. For example, a preschooler may understand that accidentally knocking over a block tower is different from deliberately destroying it. By the end of the preschool years, children begin to form a moral self-concept—an understanding of themselves as good or bad based on their actions (Thompson, 2012). Statements like "I'm a good helper" reflect early moral identity formation. Encouraging children to see themselves as kind and fair individuals strengthens their intrinsic motivation to act morally.

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16.5: Social and Emotional Milestones

Learning Objectives

1. Identify social and emotional milestones by age in the early childhood stage.

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 **16.5.1**: Social and Emotional Developmental Milestones by the CDC is in the public domain.

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
4 years	• Enjoys doing new things • 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
5 years	• Wants to please friends • 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 factors influence how children develop milestones, such as their self-perception and interactions with those around them. Let’s look more at these.

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16.6: Family Dynamics

Learning Objectives

1. Examine how families and the roles within them have evolved over time.
2. Identify different family structures.
3. Discuss the influence of sibling interactions on social and emotional development.
4. Differentiate between parenting styles and parenting strategies and the impact of each on children's development.

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 examine the demographic characteristics of its members, including family size, age, ethnicity, and gender, as well as the social class, economic level, and mobility of the family. Additionally, these studies consider the professions and education levels of the family members.

Currently, one of the most significant issues that sociologists study is the evolving roles of family members. Often, each member is limited by the traditional family's gender roles. 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 still retaining the responsibilities of childrearing. In this scenario, females' role in the labor force is "compatible with the demands of the traditional family." Sociology studies the adaptation of males' roles to those of caregivers as well as providers. 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, following separation, a child typically ends 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 16.6.1: A single-parent family. Image is in the public domain.

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; however, there are still some counties in several states that will not issue a marriage license to a same-sex couple.[22]



Figure **16.6.2**: A family with parents of the same sex. Image by Emily Walker is licensed under CC BY-SA 2.0.



Figure **16.6.3**: A family playing outside together. Image by Air Force Medical Service is in the public domain.

Sibling Relationships

Siblings spend a considerable amount of time together 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 influenced by the quality of the parent-child relationship and the child's psychological adjustment (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 reflect the parent-child relationship. Thus, when examining the quality of sibling interactions, it is often challenging to separate the effect of adjustment from the impact of the parent-child relationship.

While parents want positive interactions between their children, conflicts are inevitable, 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) found that over half of all sibling conflicts in early childhood involved disputes over property rights. By middle childhood, this begins to shift toward control over social situations, such as deciding which games to play, resolving disagreements about facts or opinions, or addressing 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 the nature of the conflict also tempers this.

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 common strategy employed by younger siblings and may be an adaptive approach for them to assert their autonomy (Abuhatoum & Howe, 2013). Some 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 16.6.4: Siblings. Image by LEONARDO DASILVA is licensed under CC BY 2.0.

Parenting Strategies and Techniques

Parenting strategies shape children's social, emotional, and cognitive development. Effective discipline fosters self-regulation and healthy relationships. Parenting discipline techniques can be categorized into positive and negative approaches, each with varying degrees of effectiveness.

Positive Discipline

Positive discipline strategies encourage cooperation and self-regulation by guiding children toward understanding appropriate behavior. These methods focus on teaching rather than punishing, promoting internalized moral development and emotional regulation (Gershoff et al., 2018).

1. **Inductive Discipline** – This strategy involves explaining to children why certain behaviors are wrong and how their actions affect others. Research suggests that inductive discipline promotes moral reasoning and empathy, enabling children to develop a sense of responsibility and exhibit prosocial behavior (Krevans & Gibbs, 1996). Children who experience inductive discipline tend to internalize moral values and show greater self-control compared to those subjected to punitive approaches (Grusec, 2011).
2. **Command Strategy** – This technique involves giving direct commands with an expectation of compliance. Parents use clear, firm, and developmentally appropriate instructions without coercion or excessive explanation (Kochanska et al., 2001). Research indicates that when commands are delivered consistently and respectfully, children are more likely to comply and develop a sense of autonomy and self-discipline (Eisenberg et al., 2005).
3. **Mutually Responsive Orientation (MRO)** – This approach emphasizes a warm, reciprocal relationship between parents and children, where discipline is based on mutual trust and cooperation rather than control (Kochanska, 2002). Studies have found that children raised in mutually responsive environments exhibit higher levels of compliance, self-regulation, and moral internalization, as they feel valued and respected (Kochanska & Aksan, 2006).
4. **Redirection** – Instead of punitive measures, redirection involves guiding a child's attention away from inappropriate behavior toward a more acceptable activity (Dunlap et al., 2006). This strategy is particularly effective for young children, as it helps them learn self-control without inducing shame or fear (Rothbart & Rueda, 2005). Research suggests that redirection is most effective when paired with explanations, reinforcing the connection between actions and consequences (Landry et al., 2006).

Negative Discipline

Negative discipline approaches rely on punishment or coercion to manage behavior. While these strategies may yield immediate compliance, research suggests they can have long-term adverse effects on children's emotional and social well-being (Gershoff & Grogan-Kaylor, 2016).

1. **Power Assertion** – This strategy involves using authority, physical force, or punishment to control a child's behavior (Baumrind, 1996). Power assertion can include verbal reprimands, threats, and physical discipline. While it may produce immediate compliance, research indicates that it can lead to increased aggression, anxiety, and lower moral internalization (Gershoff et al., 2018). Children subjected to frequent power assertion may also develop a diminished sense of autonomy and struggle with self-regulation (Holden, 2020).
2. **Love Withdrawal** – This technique involves withholding affection, approval, or attention as a means of disciplining children (Hoffman, 2000). While it may discourage negative behavior, research suggests it can damage parent-child

attachment and contribute to low self-esteem and anxiety (Rothbart & Bates, 2006). Children disciplined through love withdrawal may comply out of fear rather than a genuine understanding of moral behavior (Grusec, 2011).

Parenting Styles

Diana Baumrind (1971) presents a model of parenting that encompasses four styles, characterized by two dimensions: demandingness (or expectations) and responsiveness.

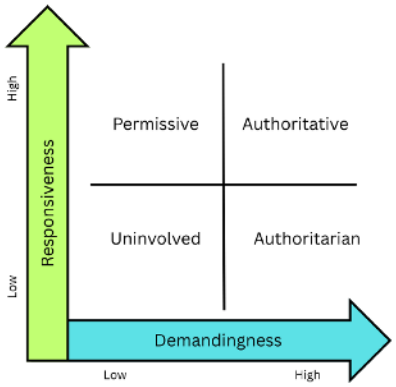


Figure 16.6.5. Parenting styles by responsiveness and demandingness. Image by Heather Carter is licensed CC BY-SA 4.0

Table 16.6.1. Parenting Styles- Characteristics and Child Outcomes

Parenting Style	Description	Characteristics	Potential Child Outcomes
Authoritative	A balanced approach with reasonable expectations, structure, and warmth.	- Strict yet reasonable rules - Open to negotiation - Discipline matches offense severity	- Develops self-discipline - High social competence - More independent and responsible
Authoritarian	A traditional model in which parents make strict rules and expect obedience.	- High maturity demands - Low warmth and communication - Little to no discussion allowed	- Fear rather than respect for parents - May become aggressive or bully peers - Lack of social competence
Permissive	Parents set few expectations and allow children to make their own rules.	- Warm and communicative - Low structure and discipline - Few behavioral expectations	- Lack of self-discipline - Struggles with boundaries - May feel insecure due to lack of limits
Uninvolved	Parents are disengaged, providing little support or expectations.	- Non-responsive and neglectful - Little to no demands on the child - Minimal emotional involvement	- Poor school performance - Struggles with peer relationships - Increased risk of behavioral issues (Gecas & Self, 1991)



Figure 16.6.6: A father interacting with his son who is drawing a picture. He could be portraying the style of a teacher-counselor or athletic coach. Image by U.S. Air Forces Central Command is in the public domain.

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 parents raise children who are 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 **16.6.7**: A family from a collectivistic culture. Image by the National Cancer Institute is in the public domain.

In "collectivistic" cultures, such as those in China or Korea, being obedient and compliant are highly valued behaviors. Authoritarian parenting has been a historical approach that reflects the cultural expectation for children to comply with authority in societies where family members' cooperation is necessary for survival, as in the case of raising crops or rearing children. In such contexts, independence and striving to be self-sufficient often make little sense. However, in an economy where mobility is essential for finding jobs and where earnings are largely determined by education, raising a child to be independent is particularly 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, Class and Conformity, Kohn (1977) explains that parents tend to emphasize qualities essential for their children's survival when parenting them. Working-class parents are rewarded for being obedient, reliable, and honest in their jobs. They are not paid to be independent or to question management; rather, they move up and are considered good employees if they show up on time, do their work as instructed, and can be relied upon by their employers. Consequently, these parents reward their children for honesty and obedience.

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. [1]

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SECTION OVERVIEW

16.7: Peers and Play

Learning Objectives

1. Identify the role of peer relationships in a child's social and emotional development.

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, in addition to those provided by their parents.



Figure 16.7.1: Navigating dramatic play provides great opportunities to continue to develop social skills with same-age peers. Image by Seattle City Council is in the public domain.

However, peer relationships can be both challenging and supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an important source of affirmation and self-esteem. Still, 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 from those that emerge in parent-child relationships. They also illustrate the numerous ways in which peer relationships influence the development of personality and self-concept. [29]

Topic hierarchy

16.7.1: Play

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16.7.1: Play

Learning Objectives

1. Identify the role of play in fostering social and emotional development in early childhood.

Play is a fundamental aspect of early childhood that significantly contributes to social and emotional development. 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 for children to develop their intellectual abilities (Dyer & Moneta, 2006). While Freud, Piaget, and Vygotsky approached play from slightly different perspectives, all three theorists viewed play as having positive outcomes for children.

Levels of Play

Levels of play were first introduced in Chapter 15, Section 5. Mildred Parten (1932) observed children aged two to five years old and identified six types of play. She labeled three types as non-social (unoccupied, solitary, and onlooker), and categorized three types 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 **16.7.1.1**: Parten's Classification of Types of Play.[1]

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 do they engage in similar activities as the children around them.
Onlooker Play	Children are observing other children playing. They may comment on the activities and even offer suggestions, but they will not participate directly in 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 they 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.

Emotional Development and Play

Play also serves as a powerful tool for emotional regulation. It allows children to process complex emotions, such as frustration, fear, and excitement, in a safe and constructive way. Through imaginative play, children can explore various emotional states and learn coping strategies that contribute to emotional resilience (Russ, 2004).

For children experiencing emotional or behavioral challenges, **play therapy** provides a structured environment where they can express thoughts and feelings that may be difficult to verbalize. Therapists use play-based interventions to help children process trauma, manage anxiety, and develop healthy emotional responses (Landreth, 2012). Through guided play, children can build self-confidence and develop problem-solving skills that extend beyond the therapy setting.

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16.8: Stress, Risks and Resilience

Learning Objectives

1. Distinguish between normal, tolerable, and toxic stress.
2. Explain how poverty, homelessness, trauma, domestic violence, and child maltreatment affect children's cognitive, emotional, and social development.
3. Identify the role of cortisol and other biological responses in the stress response system during early childhood.
4. Define resilience.
5. Describe internal and external protective factors that support recovery from adversity.
6. Describe evidence-based interventions that promote resilience.

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 affect the child's memory abilities. Stress hormones can also reduce the immune system's ability to fight 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. However, the effects of stress can be minimized if the child has the support of caring adults. Let's examine childhood stressors.

Poverty

Poverty is a significant social determinant of health and well-being, influencing all aspects of child development. Children raised in poverty often face numerous challenges that hinder their development and affect their long-term health and educational outcomes. Poverty-related stressors, such as food insecurity, poor housing conditions, and limited access to healthcare, can create a chaotic environment that impairs the ability of children to develop emotional regulation and cognitive abilities. Children from low-income families are more likely to attend schools with fewer resources, face higher rates of absenteeism, and experience lower academic achievement (Duncan & Brooks-Gunn, 2000), as well as increasing their risk for exposure to violence and neglect, which can all exacerbate the effects of poverty.

Homelessness

According to the U.S. Department of Housing and Urban Development's Annual Homeless Assessment, nearly 150,000 children under the age of 18 experienced homelessness on any given night (2024). Homelessness has profound and long-lasting effects on children's development. Children who experience homelessness face instability, lack of a stable home environment, and exposure to trauma, all of which impact their growth and development (Shinn et.al, 2008). The lack of a consistent, safe place to live can lead to difficulties in concentrating, developing social relationships, and coping with stress (Bassuk et.al, 2005; Stewart et.al, 2000).

Trauma

Trauma refers to experiences that cause significant psychological distress and can include exposure to violence, abuse, neglect, natural disasters, accidents, racism, medical trauma, terrorism, refugee or war zone trauma, suicide, loss of a loved one, etc. For children, trauma can disrupt normal developmental processes. Traumatic experiences can lead to lasting changes in brain structure and function, particularly in areas related to emotional regulation and memory. A child's reaction to a traumatic event is affected by many factors, including:

- the nature of the experience,
- whether the child was prepared for it anyway,
- the severity of the incident,
- child's age or gender,

- whether the child had a personal history of other traumatic experiences,
- child's personality characteristics,
- coping abilities, and
- pre-trauma psychological health (Skuse et.al, 2011).

Domestic Abuse

Over three 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, and cognitively. Some emotional and behavioral problems that can result from 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. Each of these types of abuse was covered in more depth in Chapter 14, Section 8. 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 16.8.1: A child hiding. Image by Joint Base Elmendorf-Richardson Alaska is in the public domain.

Resiliency and Support

While exposure to stress and adverse childhood experiences (ACEs) can have significant negative effects on development, children's **resilience**—their ability to adapt and recover—can mitigate these outcomes. Resilience is influenced by both internal factors, such as temperament and self-regulation skills, and external factors, including the presence of supportive relationships and access to resources (Masten, 2014).

Protective factors that help children develop resilience include:

- A strong, positive relationship with at least one stable and responsive caregiver is one of the most critical factors in fostering resilience (Shonkoff et al., 2012).
- Teaching children strategies for managing emotions, such as mindfulness, self-soothing techniques, and problem-solving skills, can help mitigate the long-term effects of stress (Thompson, 2019).
- Peer relationships, extended family, teachers, and mentors can serve as additional buffers against adversity (Luthar, Cicchetti, & Becker, 2000).
- Programs such as early childhood education, trauma-informed care, and after-school activities provide stability and opportunities for social-emotional growth (Ungar, 2015).

Research has identified several effective interventions that can help build resilience in children and improve their emotional, social, and cognitive development. These interventions target both the child and their environment, with a particular focus on the role of supportive relationships and community resources.

1. One of the most significant factors in building resilience is the presence of stable, *supportive relationships*. Research has shown that having at least one caring, consistent adult in a child's life can buffer the negative effects of stress and trauma (National Scientific Council on the Developing Child, 2004). Positive relationships provide children with emotional

security, opportunities for modeling healthy behaviors, and support in managing difficult emotions. Mentoring programs, play therapy, home visiting programs, and trauma-focused cognitive behavioral therapy are all strong intervention options in supporting positive relationships.

2. Teaching children *how to cope* with stress and adversity is another key component of building resilience. Coping skills, such as problem-solving, emotional regulation, and mindfulness, enable children to manage overwhelming feelings and difficult situations more effectively.
3. *Stability* in the home, school, and community helps children feel secure and fosters a sense of safety and predictability.
4. Children with a *growth mindset* believe that their abilities can improve with effort and persistence. This mindset encourages children to view challenges as opportunities for growth rather than as insurmountable obstacles, which is crucial for building resilience.
5. *Peer support* and connections to *community resources* also play a crucial role in building resilience. Children who are part of supportive peer groups or who have access to community organizations are more likely to thrive despite adversity.
6. Social-emotional learning *(SEL) programs*, such as the Collaborative for Academic, Social, and Emotional Learning (CASEL), have been shown to enhance emotional regulation, improve social skills, and reduce problem behaviors (Durlak et al., 2011). These programs teach children how to recognize and manage their emotions, set goals, show empathy, and establish positive relationships.

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CHAPTER OVERVIEW

17: Physical Development in Middle Childhood

Children in middle childhood undergo significant changes in the growth and development of their brains. During this period of development, children's bodies are not only growing, but they are also becoming more coordinated and physically capable. These children are more aware of their greater abilities in school and are taking on more responsibility for their health and diet. Some children may be challenged with physical or mental health concerns. It's essential to understand typical development to identify and support those who are struggling with health concerns.

17.1: Physical Growth

17.1.1: Motor Skills

17.2: Brain Development

17.2.1: Brain-Related Disorders

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SECTION OVERVIEW

17.1: Physical Growth

Learning Objectives

1. Describe typical physical growth patterns and growth spurts during middle childhood.
2. Define the role of human growth hormone (HGH) in child development.

Middle childhood (often referred to as the school-age years) spans the years between early childhood and adolescence, generally from ages 6 to 11, or until the onset of puberty. During this time, children come in all shapes and sizes—varying in height, weight, abilities, and developmental timelines. While general patterns of physical development exist, individual differences are common and expected.

Growth Patterns and Spurts

Physical growth during middle childhood is usually described as slow and steady, with children gaining approximately 5 to 7 pounds and growing about 2 inches per year (Centers for Disease Control and Prevention [CDC], 2022). However, this steady growth can be misleading. Growth does not occur at a uniform rate every day. Instead, research suggests that children often grow in spurts, sometimes experiencing significant increases in height within just 24 hours, followed by periods of little or no growth (Adolph & Hoch, 2019). These short bursts of rapid growth may be more common during certain seasons; many children grow fastest during spring or summer, although patterns can vary individually (Pérez-Escamilla et al., 2021).

In addition to increasing in height and weight, children in middle childhood tend to slim down, gaining muscle mass and strength as baby fat decreases. Their bodies become more proportionate, as the extremities grow faster than the trunk, resulting in a more adult-like appearance. Strengthening muscles and lengthening bones encourages children to engage in strenuous physical activity, such as sports, biking, or climbing. Their increased stamina and motor skills enable longer and more coordinated play, which is crucial for overall health and well-being.

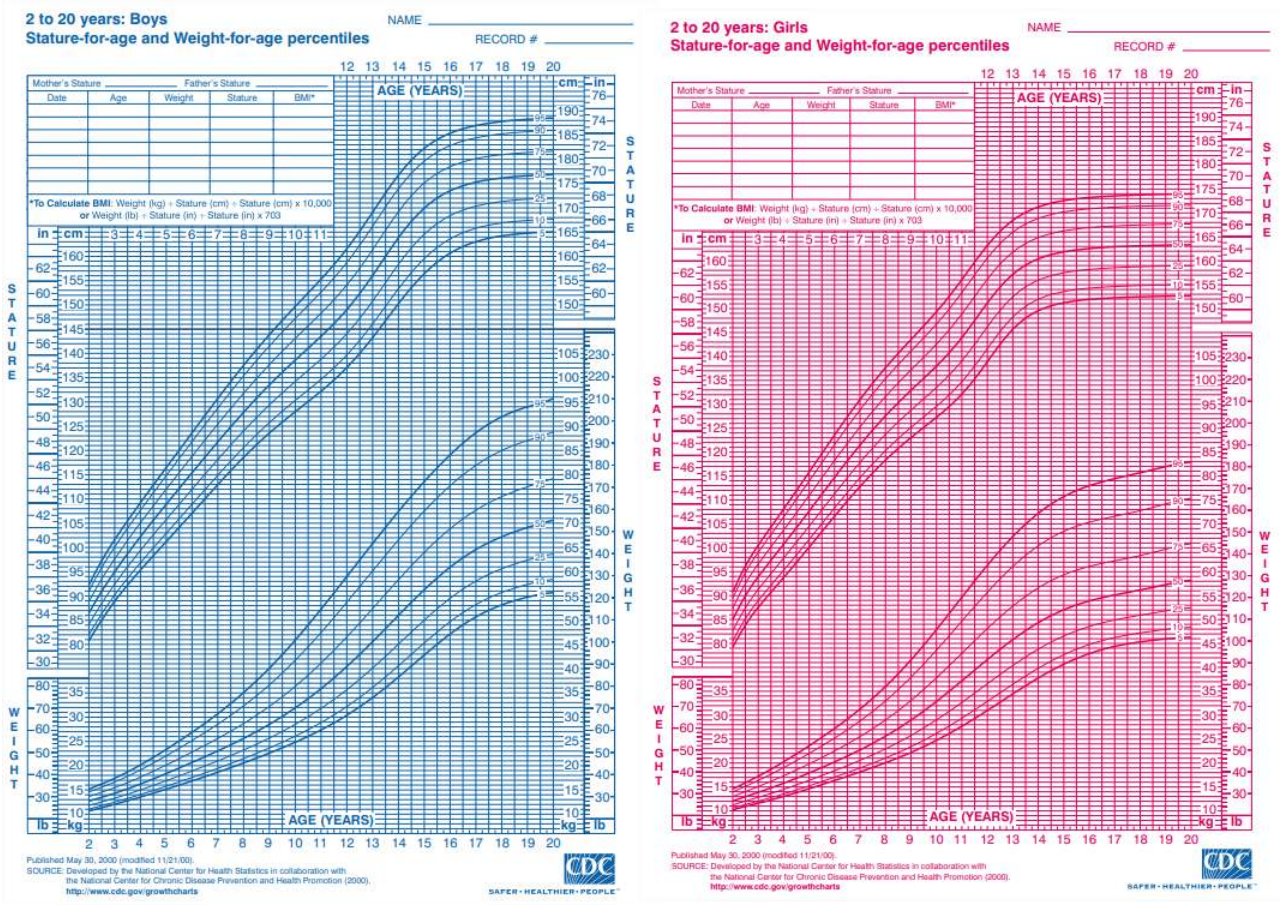


Figure 17.1.1: Stature for age and weight for age percentiles of boys and girls. Images by the CDC is in the public domain.

Differences Between Boys and Girls

As children approach late middle childhood, growth accelerates again as they prepare to enter adolescence and the associated hormonal changes of puberty. This prepubescent growth spurt typically begins around age 9 or 10 for girls and closer to age 11 for boys, resulting in noticeable differences in physical development between the sexes. This is why girls may temporarily be taller or more physically developed than boys of the same age. The earlier onset of puberty-related growth in girls is linked to the earlier rise in estrogen, while boys catch up and often surpass girls in height after entering puberty, due to a later and more prolonged testosterone-driven growth period (Rogol & Clark, 2008).

Growing Pains

As bones lengthen and broaden during this time, and as children engage in more physical activity, many report growing pains, particularly in the evening or at night. These pains are often described as an aching or throbbing in the legs, especially in the shins, calves, or behind the knees, but also sometimes in the arms. While not directly caused by growth itself, these pains are thought to be related to the increased physical demands placed on growing muscles and joints (Hashkes & Uziel, 2011).

Growing pains are common and usually harmless; however, persistent or severe pain should be evaluated to rule out other potential conditions. There are simple and effective ways to help soothe growing pains, such as gentle massaging or stretching right before bed, using a warm compress, or applying a heating pad.

Human Growth Hormone (HGH)

A key player in physical development is the human growth hormone (HGH), a peptide hormone secreted by the pituitary gland that stimulates bone and tissue growth. HGH is essential for normal physical development in childhood. In some cases, children may be diagnosed with growth hormone deficiency (GHD), a medical condition in which the body does not produce enough HGH to support normal growth. This can lead to shorter stature and delayed physical development if left untreated.

Treatment for GHD typically involves daily injections of synthetic HGH, which has been shown to significantly increase growth rates and help children achieve a more typical adult height when started early (Grimberg et al., 2016). However, HGH treatment is not without controversy, especially when used in children without a medical deficiency simply to increase final height. In such cases, the benefits may not outweigh the costs and potential risks.

Topic hierarchy

17.1.1: Motor Skills

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17.1.1: Motor Skills

Learning Objectives

1. Describe how neurological, physical, and cognitive development during middle childhood contributes to improvements in fine and gross motor skills.
2. Explain how these advancements support academic success, physical activity, and social participation.
3. Identify physical development milestones by age for school age children.

During middle childhood, children undergo notable refinement in both fine and gross motor skills. Fine motor skills involve small, precise movements, while gross motor skills involve larger movements. As muscle mass increases and bones continue to grow and strengthen, children gain greater strength, balance, and control in their physical movements.

Improvements in motor skills during middle childhood are due to several key developmental processes.

1. First, neurological growth enhances coordination and reaction times. Increased myelination during this stage enables faster communication between the brain and muscles, allowing for more fluid and deliberate movement.
2. Second, physical changes in the muscular and skeletal systems enable children to develop the strength and endurance necessary for participating in more complex motor tasks.
3. Third, repeated practice through school, sports, hobbies, and daily routines leads to increased motor competence.
4. Finally, cognitive development supports planning, sequencing, and focusing on tasks that involve physical coordination, such as sports, crafts, and keyboarding.

As children gain more control over their bodies, they become more capable of managing everyday tasks and school activities. Fine motor development is crucial for academic success, as it directly impacts writing and the use of tools and classroom materials. Gross motor development supports physical play and participation in sports, which are essential for both physical health and socialization.

Milestones

The following table outlines typical fine and gross motor milestones for children between the ages of 5 and 11, broken down by grade level. These milestones serve as general guidelines, and individual children may develop skills at different rates.

Table **17.1.1.1**. Fine and Gross Motor Skills by Age

Age/Grade	Fine Motor Skills	Gross Motor Skills
5-6 years	- Can copy basic shapes and letters - Begins to tie shoes - Uses utensils with improving control	- Runs, jumps, and skips with better coordination - Begins to balance on one foot - Rides a tricycle or two-wheeled bike with training wheels
6-7 years	- Writes more clearly and neatly - Uses scissors with control - Can manipulate small objects like buttons and zippers independently	- Improves balance and agility - Throws and catches a ball with better accuracy - Begins to show form in sports (e.g., dribbling, swinging a bat)
7-8 years	- Forms letters and numbers with uniform size - Can use a ruler and glue small items neatly - Completes increasingly detailed drawings	- Can skip, gallop, and run smoothly - Begins to coordinate movements in team sports - Increases endurance and stamina
8-9 years	- Uses cursive or joined writing (if taught) - Can type slowly on a keyboard - Performs more complex craft or building tasks	- Displays better control over speed, direction, and strength - Can ride a two-wheeled bike confidently - Shows refined skills in physical education or playground games
9-10 years	- Writes longer, neater paragraphs - Assembles model kits or builds with precision - Keyboarding skills improve	- Jumps rope rhythmically - Participates more competitively in sports - Improved hand-eye and foot-eye coordination
10-11 years	- Writes quickly and legibly for extended time - Uses tools like compasses or protractors in school tasks - Demonstrates creative expression through art, music, or cooking	- Coordinates body movements in complex sports or dance - Practices strategy and timing in physical play - Shows consistent strength, balance, and rhythm

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SECTION OVERVIEW

17.2: Brain Development

Learning Objectives

1. Describe major structural and functional changes in the brain during middle childhood.
2. Explain the role of myelination and synaptic pruning in improving processing speed, memory, and cognitive efficiency.
3. Discuss how neurological development during middle childhood supports executive function, attention, and learning.
4. Identify how repeated experiences and learning shape brain architecture during this stage of development.

Typical Brain Development

The brain undergoes significant maturation during middle childhood, laying the foundation for advancements in thinking, learning, behavior, and emotional regulation. While the brain reaches approximately 90–95% of its adult size by around age 7, structural and functional development continues well into adolescence (Giedd et al., 1999). Between the ages of 10 and 12, the frontal lobes undergo significant development, which supports the growth of executive functions (van der Molen, 2000).

Processes and Changes in Brain Activity

One of the most important processes taking place in the school-aged brain is myelination. **Myelination** is the formation of a fatty sheath (myelin) around the axons of neurons. This sheath acts like insulation on electrical wires, allowing signals to be transmitted more rapidly and efficiently between different parts of the brain and nervous system. As myelination increases, children's reaction times improve, their thoughts become more organized, and they can process information more quickly and accurately. From ages 6 to 12, the nerve cells in the association areas of the brain—which are regions where sensory, motor, and intellectual functions are integrated—become nearly fully myelinated (Swaiman, 1978). This process supports the development of more complex cognitive tasks and smoother coordination between different types of input, such as understanding both verbal instructions and visual cues simultaneously.

The hippocampus, which plays a key role in memory consolidation—transferring information from short-term memory to long-term storage—also undergoes further myelination during this period. This development contributes to noticeable improvements in memory functioning, allowing children to retain, recall, and apply learned material more effectively (Rolls, 2000).

At the same time, the brain is continuing to undergo synaptic pruning from early childhood. This helps increase the brain's efficiency and tailor it to the child's unique experiences and learning environment (Kolb & Gibb, 2011). This is one reason repeated practice and exposure are so crucial during this developmental period—each learning experience helps shape and refine the brain's architecture.



Figure 17.2.1: The human brain. Image by _DJ_ is licensed under CC BY-SA 2.0.

Research also shows that learning something new doesn't just create an immediate effect; instead, learning can change the chemical pathways in the brain for hours or even days afterward. Neurons continue to fire and reorganize themselves following new experiences, which enhances long-term learning and adaptive thinking (Draganski et al., 2004). These processes occur mostly in the posterior regions of the brain during middle childhood, particularly in the parietal and occipital lobes, which are involved in spatial awareness/processing and attention. Activity in these regions supports learning in all academic areas across the curriculum.

As the prefrontal cortex matures, children also develop improved attention span and emotional regulation. These brain changes allow children to begin thinking more logically and systematically. They can engage in more effective problem-solving and begin to consider multiple perspectives. This increased cognitive flexibility also enables them to handle more responsibility in school and social settings.

Topic hierarchy

17.2.1: Brain-Related Disorders

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17.2.1: Brain-Related Disorders

Learning Objectives

1. Identify the core symptoms, diagnostic criteria, and presentations of Attention-Deficit/Hyperactivity Disorder (ADHD).
2. Explain known risk factors and treatments for ADHD.
3. Define Specific Learning Disorder (SLD).
4. Describe neurological and behavioral characteristics associated with dyslexia.
5. Summarize effective intervention strategies and classroom supports for children with ADHD and SLD.

Attention Deficit/Hyperactivity Disorder (ADHD)

The exact causes of ADHD are unknown; however, research has demonstrated that factors that many people associate with the development of ADHD 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 identified several significant risk factors that affect neurodevelopment and behavioral expression. Events such as maternal alcohol and tobacco use that affect the development of the fetal brain can increase the risk for ADHD. Injuries to the brain from environmental toxins, such as iron deficiency, have also been implicated.

Symptoms

People with ADHD 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 fails to follow through on instructions and fails to complete schoolwork, chores, or workplace duties (e.g., loses focus and gets sidetracked).
- Often has trouble organizing tasks and activities.
- Often avoids, dislikes, or is reluctant to undertake tasks that require mental effort over a prolonged period (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 17.2.1.1: This child is exhibiting inattention. Image by Ben Paarmann is licensed under CC BY 2.0.

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 feel 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 17.2.1.2: This child is exhibiting hyperactivity and impulsivity. Image by Marc Lewis is licensed under CC BY-SA 2.0.

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 schizophrenia or another psychotic disorder.

Presentation

Based on the types of symptoms, three kinds (presentations) of ADHD 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 also change accordingly.[54] The diagnosis of ADHD can be made reliably using well-tested diagnostic interview methods. However, as of yet, there is no independent, valid test for ADHD.

Among children, ADHD 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 ADHD. 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.

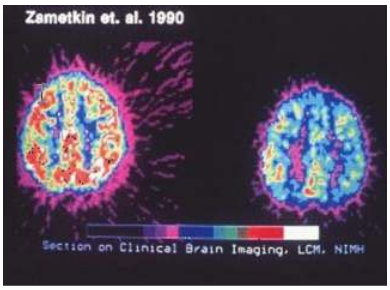


Figure 17.2.1.3: Brain scans of brains with and without ADHD. Image by the National Institutes of Health is in the public domain.

In addition to the well-established treatments described above, some parents and therapists have tried a variety of nutritional interventions to treat ADHD. 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 ADHD.[56]

Specific Learning Disorder

Specific learning disorder (SLD) is a broader category that includes not only dyslexia but also difficulties in other academic areas, such as mathematics (dyscalculia) and written expression (dysgraphia). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), defines SLD as a neurodevelopmental disorder that affects a child's ability to perform academically in one or more areas, despite having the opportunity to learn and adequate intelligence. SLD can be diagnosed when academic difficulties significantly interfere with daily functioning, such as causing frustration, poor academic performance, or social difficulties.

The core feature of specific learning disorder is a discrepancy between a child's actual academic performance and what would be expected based on their age, schooling, and intelligence. For example, a child with SLD may be able to solve math problems conceptually but struggle with performing calculations or understanding mathematical symbols.

Dyslexia

Dyslexia is one of the most common learning disabilities in children, specifically characterized by difficulties with accurate or fluent word recognition and poor spelling and decoding abilities. These difficulties occur despite adequate intelligence and exposure to appropriate teaching methods. Children with dyslexia often struggle with reading comprehension, which can significantly impact their academic progress, as reading skills are foundational to learning in most subjects.

In middle childhood, the signs of dyslexia become more pronounced as children are expected to read fluently and understand increasingly complex text. Children with dyslexia may struggle with decoding words and tend to avoid reading tasks. They might also experience difficulty with spelling, writing, and sometimes even with understanding spoken language.

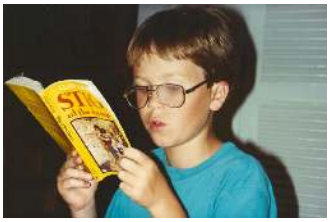


Figure 17.2.1.4: A 7-year-old boy with visual dyslexia wears corrective bifocal glasses while reading. Image by Charlesjsharp is licensed CC BY 2.5.

Dyslexia is believed to have a neurological basis, and studies suggest that it is related to differences in the way the brain processes written and spoken language (Shaywitz, 2003). Specifically, individuals with dyslexia often show reduced activity in the left hemisphere of the brain, particularly in areas involved in language processing, such as the left temporoparietal region, which is responsible for decoding and processing words. It is essential to note that dyslexia is not directly linked to intelligence; many children with dyslexia possess average or above-average intelligence.

Interventions and Support

Effective interventions for children with dyslexia or specific learning disorder are available, and early identification is key. Specialized teaching methods, such as structured literacy programs, can help children with dyslexia improve their reading and

spelling skills. These methods focus on phonemic awareness, phonics, fluency, vocabulary, and reading comprehension. Multisensory instruction, which involves visual, auditory, and kinesthetic learning, is often effective in reinforcing learning (Birsh, 2011).

In addition to direct instruction, children with SLD may benefit from accommodations, such as extended test-taking time, the use of assistive technology (e.g., text-to-speech software), and alternative ways of demonstrating knowledge (e.g., oral reports instead of written assignments). Classroom modifications and individualized education plans (IEPs) are commonly used to ensure that children with learning disorders receive the support they need to succeed academically.

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SECTION OVERVIEW

17.3: Physical Health

Learning Objectives

1. Identify common vision and hearing concerns during middle childhood.
2. Describe the process of dental development and summarize best practices for promoting oral health in school-age children.
3. Differentiate between Type 1 and Type 2 diabetes in children.
4. Explain the physiological mechanisms of asthma and recognize strategies for managing asthma in childhood.

Vision and Hearing

The most common vision problem in middle childhood is nearsightedness, also known as myopia. Twenty-five percent of children will be diagnosed by the end of middle childhood. Being nearsighted can be corrected by wearing glasses with corrective lenses.



Figure 17.3.1: Eye exams are recommended annually for school-age children. Image is in the public domain.

Children may experience multiple ear infections in early childhood, but this is less common within the 6- to 12-year age range. Numerous ear infections during middle childhood may lead to headaches and migraines, which may result in hearing loss.[32]

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 essential for children to visit a dentist twice a year to ensure their teeth remain healthy and to provide continuous monitoring as they lose teeth and new ones emerge. Many children have some form of malocclusion (when the upper teeth aren't correctly positioned slightly over the lower teeth, including underbites and overbites) or malposition of their teeth, which can affect their ability to chew, 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, making their own 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.[34]

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



Figure 17.3.2: A boy brushing his teeth. Image by Latrobebohs is licensed under CC BY-SA 3.0.

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 to help your child learn 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 a combination of flossing, brushing, and adding fluoride, a mineral commonly 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.

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 of 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. [35]



Figure 17.3.3: The finger-prick test. Image by the U.S. Army is in the public domain.

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 is helpful to know how the airways function. The airways are tubes that carry air into and out of your lungs. People who have asthma have inflamed airways. The inflammation causes the airways to become swollen and very sensitive. The airways tend to react strongly to certain inhaled substances. When the airways react, the surrounding muscles tighten. This narrows the airways, resulting in less air flowing into the lungs. The swelling can also 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.

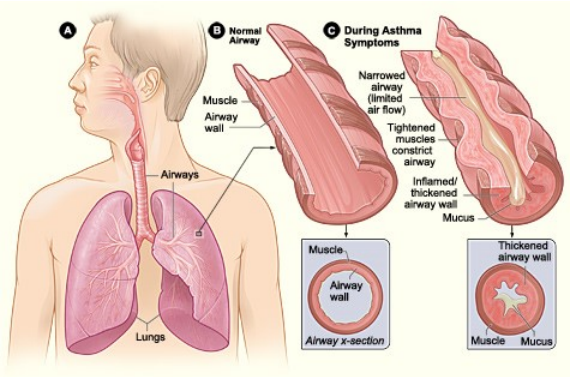


Figure 17.3.4: **Figure A** shows the location of the lungs and airways in the body. **Figure B** shows a cross-section of a normal airway. **Figure C** shows a cross-section of an airway during asthma symptoms. Image by the National Heart, Lung, and Blood Institute is in the public domain.

Sometimes, asthma symptoms are mild and resolve on their own or with minimal treatment using asthma medication. At other times, symptoms continue to worsen. When symptoms get more intense and/or more symptoms occur, you're having an asthma attack. Asthma attacks are also called flare-ups or exacerbations (eg-zas-er-BA-shuns).

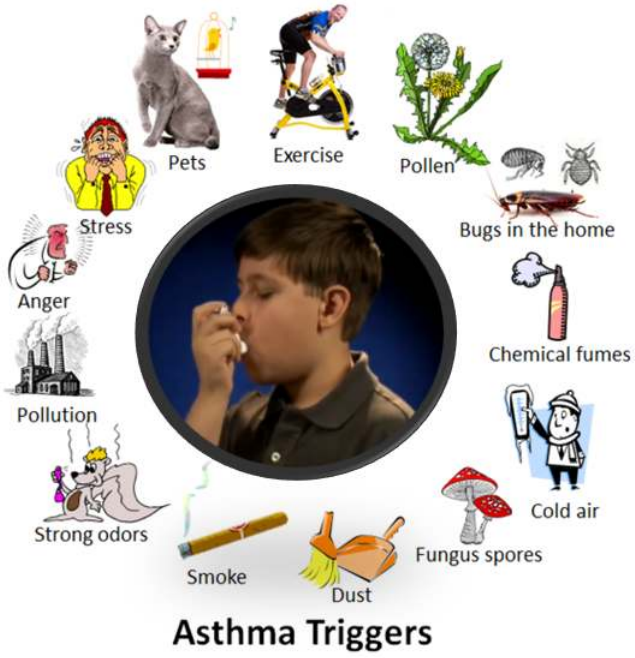


Figure **17.3.5**: The different things that can trigger asthma. Original image by 7mike5000 is licensed under CC BY-SA 3.0. Image modified by adding content from a video by the CDC, which is in the public domain.

Treating symptoms as soon as 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.[39]

Topic hierarchy

17.3.1: Sleep

17.3.2: Backpacks

17.3.3: Staying Healthy

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17.3.1: Sleep

Learning Objectives

1. Identify the recommended amount of sleep for school-age children.
2. Explain the role of sleep in physical and cognitive development.
3. Describe strategies that support healthy sleep habits and routines in middle childhood.
4. Explain the causes, types, and treatments of nocturnal enuresis, and recognize the importance of a supportive response.

School-age children typically need between 9 and 12 hours of sleep per night to support optimal health and development (Paruthi et al., 2016). This recommendation reflects not only the body's need for physical rest but also the brain's need for consolidation of learning and development. However, many children in this age group do not consistently get the recommended amount of sleep due to busy schedules, excessive screen time, or poor sleep habits.

Encouraging Quality Sleep

Several strategies can help promote healthy sleep patterns in school-age children. A consistent bedtime and wake time, even on weekends, helps regulate the circadian rhythm. Creating a bedtime routine that includes calming activities, such as reading or listening to soft music, can signal to the brain that it's time to wind down. The sleep environment should be quiet and dark, with limited screen exposure before bedtime. Research suggests that exposure to blue light from tablets and televisions can delay the release of melatonin, making it harder for children to fall asleep (Hale & Guan, 2015).



Figure 17.3.1.1. A young girl uses her tablet before going to bed. Image by cottonbro studio licensed by Pexels.

Physical activity during the day also contributes to better sleep quality, though vigorous activity right before bedtime should be avoided. Dietary habits can also play a role; consuming large meals or caffeine too close to bedtime can interfere with the ability to fall or stay asleep.

Consequences of Poor Sleep

Insufficient or poor-quality sleep in middle childhood is associated with a range of negative outcomes. Sleep deprivation has been linked to difficulties with attention, memory, and executive functioning, which can in turn affect academic achievement (Astill et al., 2012). It may also lead to behavioral problems such as irritability, hyperactivity, and emotional dysregulation, often mimicking symptoms of attention-deficit/hyperactivity disorder (Beebe, 2011).

In addition to cognitive and behavioral issues, chronic sleep deprivation can impact physical health. It may weaken the immune system, disrupt growth hormone secretion, and increase the risk for obesity, as tired children are more likely to be sedentary and overeat (Taheri et al., 2004). The compounding effects of inadequate sleep may also influence social development, as tired children are more likely to struggle with peer relationships and social problem-solving.

Nocturnal Enuresis

One common sleep-related concern is **nocturnal enuresis**, also known as bedwetting. This condition is defined as involuntary urination during sleep in children over the age of five. It can be categorized as primary (when the child has never achieved consistent nighttime dryness) or secondary (when bedwetting reoccurs after a period of dryness). It affects an estimated 5–10% of 7-year-olds, with prevalence decreasing with age (Nevéus et al., 2010).

Nocturnal enuresis can result from a combination of factors, including delayed bladder control, deep sleep patterns, reduced nighttime production of antidiuretic hormone (ADH), or a genetic predisposition. Emotional stress, such as parental divorce or school transitions, may also contribute to secondary enuresis.

While not typically harmful from a physical health perspective, bedwetting can lead to significant embarrassment and distress for children. Encouraging a supportive and non-punitive approach is essential. Treatments may include behavioral strategies (such as scheduled nighttime waking or bladder training), moisture alarms, and in some cases, medication (e.g., desmopressin). It is important for families and educators to understand that enuresis is not a child's fault and that most children outgrow it with time and support.

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17.3.2: Backpacks

Learning Objectives

1. Explain recommended backpack weight limits for school-age children.
2. Identify associated health risks of improper use.
3. Identify practical strategies to reduce backpack-related strain and promote safe use.



Figure 17.3.2.1. A school-age boy wearing a backpack. Image by Muhammad Ali Raza is licensed by Pexels.

Backpacks are a daily necessity for school-aged children, but when overloaded or worn improperly, they can pose risks to a child's musculoskeletal development. Organizations such as the American Physical Therapy Association (APTA), American Chiropractic Association (ACA), and American Academy of Pediatrics (AAP) recommend that a child's backpack weigh no more than 10–15% of their body weight (APTA, 2020; ACA, 2017; AAP, 2014).

Exceeding this weight limit can lead to back and neck pain, poor posture, muscle strain, and even changes in spinal alignment. Children often compensate by leaning forward or arching their backs, which can strain muscles and joints. Symptoms may include shoulder pain, headaches, or tingling in the arms (Negrini & Carabalona, 2002). Discomfort from backpacks may also affect concentration and reduce participation in physical activities.

To reduce injury risk, children should use both padded shoulder straps, ensure the backpack sits high and centered on the back, and use waist or chest straps when available. Heavy items should be packed closest to the body, and backpacks should be emptied or cleaned out regularly to prevent damage. Rolling backpacks or increased locker use may also help.

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17.3.3: Staying Healthy

Learning Objectives

1. Identify healthy lifestyle behaviors that support the well-being of children.

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
- Staying up to date on recommended vaccines and boosters per the American Academy of Pediatrics
- Practicing mindfulness or relaxation techniques [58]



Figure 17.3.3.1: Staying healthy is critical for all children, especially those who may have mental health disorders. Image by the U.S. Marine Corps is in the public domain.

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SECTION OVERVIEW

17.4: Healthy Eating

Learning Objectives

1. Identify the key factors influencing children's eating habits and attitudes toward food during middle childhood.
2. Explain the role of school meal programs and nutrition campaigns in supporting child development.
3. Compare typical energy and nutrient needs for school-aged children by age, gender, and activity level.
4. Distinguish between food allergies and food intolerances, including symptoms and common treatment strategies.

Healthy Eating

Several factors can influence children's eating habits and attitudes toward food. The family environment, societal trends, taste preferences, and messages in the media all influence the emotions that children develop regarding their diet. Television commercials can entice children to consume sugary products, fatty fast foods, excess calories, refined ingredients, and high sodium levels. Therefore, parents and caregivers must direct children toward healthy choices. [5]

At this stage in a child's life, parents and other caregivers have the opportunity to reinforce good eating habits and introduce new foods into the diet, all while being mindful of the 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 introduce a wide variety of health-promoting foods into the home, allowing their children to make informed choices.[6]



Figure 17.4.1: A modern meal. Image by Sharon Ang is licensed under CC0.

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. Not only has what we eat changed, but the amount of it that we consume has also dramatically increased, as plates and portion sizes have grown significantly larger. All of these choices impact our health, with short- and long-term consequences as we age. Possible short-term effects include excessive 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 supports physical and mental development, promoting overall 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 to last 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]



Figure 17.4.2: Nutrition guidelines from the USDA. Image by the USDA is in the public domain.

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.[11]

School Lunch Programs

Many school-age children eat breakfast, snacks, and lunch at their schools. Therefore, schools need to provide nutritionally sound meals. In the United States, more than 31 million children from low-income families receive meals provided by the National School Lunch Program. This federally funded program provides low-cost or free breakfast, snacks, and lunches to schools. School districts that participate receive subsidies from the US Department of Agriculture (USDA) for every meal they serve that meets the 2015 Dietary Guidelines for Americans.

Knowing that many children in the United States receive free or subsidized lunches in the school cafeteria, it may be worthwhile to examine the nutritional content of these meals. 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, a breadstick, peach cup, tomato soup, a brownie, and 2% milk, which complies with Federal Nutritional Guidelines. Consider another menu from an elementary school in Washington state. This sample meal consists of a 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. There is a significant difference in the calories and nutritional value of these prepared lunches, which are chosen and approved by officials on behalf of children in these districts.



Figure 17.4.3: Children eating lunch together at school. Image by Nancy Benecki is in the public domain.

Healthy School Lunch Campaigns help 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, but they are also adding additional empty calories to their daily intake. These districts should review their menus and determine the rationale for offering additional snacks and desserts to 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.[17]

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 per day from age 2 to 8 and 1,400 to 1,800 calories from age 9 to 13. Boys also need 1,200 to 1,400 calories daily from ages 4 to 8, but their daily caloric needs increase to 1,600-2,000 from ages 9 to 13. This range represents individual differences, including the child's level of activity.[12]

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.

Food Allergies and Food Intolerance

Food intolerance and food allergies are issues for some school-aged children. Recent studies indicate that approximately three million children under the age of eighteen are allergic to at least one type of food. Some of the most common **food allergies** are caused by foods such as peanuts, milk, eggs, soy, wheat, and shellfish. An allergy occurs when a protein in food triggers an immune response, resulting in the release of antibodies, histamine, and other mediators 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.[19]

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 common food allergens that 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.[20]



Figure 17.4.4: An EpiPen. Image by Sean William is licensed under CC BY-SA 3.0.

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 gastrointestinal 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.[22]

Topic hierarchy

17.4.1: Obesity and Overweight

17.4.2: Eating Disorders

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17.4.1: Obesity and Overweight

Learning Objectives

1. Define overweight and obesity in children using the Body Mass Index (BMI) percentiles.
2. Identify current trends and contributing factors to the rise in childhood obesity.
3. Discuss the physical, cognitive, and emotional consequences associated with excess weight in children.
4. Evaluate the importance of caregiver awareness and support in promoting healthy habits and eating behaviors.

Being Overweight and Obesity in Children

Childhood overweight and obesity remain significant public health concerns. The current measurement for determining excess weight is the **Body Mass Index (BMI)** which expresses the relationship of height to weight. The Centers for Disease Control and Prevention (CDC) define overweight in children as a Body Mass Index (BMI) at or above the 85th percentile and below the 95th percentile for children of the same age and sex; obesity is defined as a BMI at or above the 95th percentile (CDC, 2022).

Recent data indicate that approximately 19.7% of U.S. children and adolescents aged 2–19 years are obese (CDC, 2022). 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 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 have led to an increase in children being overweight or obese.



Figure 17.4.1.1: There are certain health risks associated with being overweight. Image by Gaulsstin is licensed under CC BY 2.0.

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**”. Studies have found that a substantial proportion of parents underestimate their child's weight status, with factors such as lower socioeconomic status and higher parental BMI contributing to this misperception (Lundahl et al., 2014). Similarly, many overweight children do not recognize their weight status accurately, which can hinder motivation for behavior change (Sarafrazi et al., 2014).

Results of Childhood Obesity

Excess weight in children is associated with impairments in executive functions, including working memory, attention, and cognitive flexibility (Liang et al., 2014). Neuroimaging studies have linked higher BMI with reduced cortical thickness in the prefrontal cortex, a region critical for executive functioning (Laurent et al., 2020). Additionally, diets high in saturated fats and sugars may compromise the integrity of the blood-brain barrier, particularly in the hippocampus, which can affect memory and learning processes (Davidson et al., 2013).

Children with obesity also often face social challenges, including bullying and social exclusion, which can lead to low self-esteem and depression (Puhl & Latner, 2007). Furthermore, obesity in childhood increases the risk of orthopedic problems, type 2 diabetes, and cardiovascular diseases later in life (Daniels et al., 2005).

Dieting is not really the answer. If you diet, your basal metabolic rate tends to decrease, thereby making the body burn even fewer calories to maintain its weight. Increased activity is much more effective in lowering 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 in teens. Again, helping children to make healthy food choices and increasing physical activity will help prevent childhood obesity.[25]

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17.4.2: Eating Disorders

Learning Objectives

1. Describe how disordered eating behaviors can emerge during middle childhood.
2. Explain the influence of media, cultural ideals, and peer perceptions on body image in school-aged children.



Figure 17.4.2.1. A girl is standing on a modern scale. Image by Nenad Stojkovic is licensed CC BY 2.0.

Although eating disorders are more commonly diagnosed in adolescence, the roots of disordered eating often emerge during middle childhood. During this stage, some children begin to express a strong desire to be thin, and concerns about body image may surface. These early signs can represent the beginning of a spectrum of disordered eating behaviors, some of which are associated with being severely underweight (Smolak, 2011).

Exposure to media and cultural ideals of thinness can contribute to body dissatisfaction, even in children as young as six or seven (Rodgers et al., 2018). By preadolescence, between 40-50% of girls report wanting to be thinner (Wertheim et al., 2008). Children may start to equate being thin with being accepted, popular, or successful. This can lead to unhealthy behaviors such as skipping meals, excessive exercise, or restrictive eating—all of which may go unnoticed by adults (Jansen et al., 2021).

It is important to emphasize that children in middle childhood require a balanced diet to support their physical development. Nutrients are essential for muscle and bone growth, which are especially important as the body prepares for the rapid changes of puberty (Golden et al., 2016). Parents, educators, and caregivers can help by promoting a positive body image, encouraging balanced eating habits, and addressing weight-related comments or behaviors with sensitivity and support.

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17.5: Childhood Mental Health

Learning Objectives

1. Describe the connection between brain development and mental health in middle childhood.
2. Identify common mental health disorders in school-aged children.
3. Explain the signs and symptoms associated with internalizing disorders in children.
4. Evaluate the role of accurate diagnosis and labeling in accessing support and shaping a child's self-concept.

Childhood Mental Health Disorders

It is important to recognize that the physical development of the brain is tightly interwoven with children's emotional and social growth. As they develop greater self-awareness, school-aged children become increasingly sensitive to how others perceive them. They may experience a range of social and emotional challenges, such as managing peer relationships or coping with feelings of self-doubt or exclusion. For some children, this developmental stage may also coincide with the onset of mental health concerns.

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 manual serves as a standard across the profession for diagnosing and treating mental disorders.[42]

Understanding these neurological changes provides professionals and caregivers with insight into how children perceive the world around them and why middle childhood is a critical time for promoting healthy development.

Social and Emotional Disorders

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

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 stimulus 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 exhibit specific effects and characteristics when it comes to phobias. The effects of anxiety show up by crying, throwing tantrums, experiencing freezing, or clinging to the parent with whom they have the most connection. Related conditions include anxiety.

Anxiety

Many children have fears and worries, and will feel sad and hopeless from time to time. Strong fears may emerge at various stages of 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 feelings of fear and sadness could be due to anxiety or depression. Because the symptoms primarily involve thoughts and feelings, they are called **internalizing disorders**.



Figure 17.5.1: An anxious child. Image is in the public domain.

When children do not outgrow the fears and worries that are typical in young children, or when so many fears and worries 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 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 Disorder (PTSD)

Exposure to traumatic events can have major developmental influences on children. While the majority of children will not develop PTSD after a trauma, the best estimates from the literature are that around a third of them will, which is 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 shows that up to 90% of children may experience heightened physiological arousal, diffuse anxiety, survivor's guilt, and emotional liability. These are all normal reactions and should be understood as such (similar things are seen in adults. Those children still experiencing these symptoms three or four months after a disaster, however, may require further assessment, particularly if they also exhibit the following symptoms. For older children, warning signs of problematic adjustment include: repetitious play reenacting a part of the disaster; preoccupation with danger or expressed safety concerns; 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.[46]

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 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 triggers an obsessive thought that they will contract an illness 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 thoughts. [47]

Depression

Occasionally, being sad or feeling hopeless is a part of every child's life. However, some children may feel sad or uninterested in things they used to enjoy, or feel helpless or hopeless in situations where they could take action to address the issue. When children

feel persistent sadness and hopelessness, they may be diagnosed with depression.



Figure 17.5.2: Persistent sadness is a symptom of depression. Image is in the public domain.

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, have hopelessness about the future, or worry excessively that a parent may die. Older children and teens may sulk, get into trouble at school, exhibit negative or grouchy behavior, be irritable, indecisive, struggle with concentration, 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.[49]

When You Have a Concern About a Child. What's in a Label?

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 who 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.[43]

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SECTION OVERVIEW

17.6: Physical Activity

Learning Objectives

1. Explain the recommended daily physical activity guidelines for school-age children.
2. Identify examples of aerobic, muscle-strengthening, and bone-strengthening activities appropriate for this age group.
3. Analyze the impact of the COVID-19 pandemic on physical activity patterns in children.

Physical Activity in Middle Childhood

Physical activity is essential for the healthy development of children in middle childhood. Regular physical activity helps improve physical health, enhance cognitive functioning, regulate emotions, and support social development. The U.S. Department of Health and Human Services (HHS, 2018) recommends that children aged 6 to 17 engage in at least 60 minutes of moderate to vigorous physical activity each day.

During middle childhood, physical activity also provides critical opportunities for social development. Through active play, sports, and movement games, children learn teamwork, cooperation, conflict resolution, and perseverance. Encouraging physical activity in daily routines can support healthy habits that extend into adolescence and adulthood. It is important to foster inclusive environments that welcome children of all ability levels and backgrounds to participate and enjoy movement.

Types of Activities



Figure 17.6.1. Jumping rope is aerobic and engages children in both bone and muscle strengthening. Image by RDNE Stock Project is licensed by Pexels.

These guidelines emphasize a variety of activity types, including aerobic, muscle-strengthening, and bone-strengthening exercises. Most of the hour should be spent on aerobic activity, but many activities provide benefits for both bone and muscle strengthening.

Aerobic activities improve cardiovascular fitness and endurance and should be performed daily. **Bone-strengthening** activities, such as jumping and running, should be included at least three times per week. **Muscle-strengthening** activities, such as using monkey bars or resistance exercises that utilize body weight, should be performed at least three times a week. These activities help children develop strength, coordination, balance, and healthy growth patterns (Physical Activity Guidelines Advisory Committee, 2018).

The Impact of COVID-19

The COVID-19 pandemic significantly disrupted children's access to regular physical activity. School closures, limited access to playgrounds and recreational facilities, and increased screen time contributed to reductions in physical activity and fitness levels (Dunton, Do, & Wang, 2020). Children who were already at risk for inactivity were disproportionately affected, and the impact

continues to influence physical activity patterns even as many public spaces and schools return to pre-pandemic routines (Moore et al., 2020).

During middle childhood, physical activity also provides critical opportunities for social development. Through active play, sports, and movement games, children learn teamwork, cooperation, conflict resolution, and perseverance. Encouraging physical activity in daily routines can support healthy habits that extend into adolescence and adulthood. It is essential to create inclusive environments that welcome children of all abilities and backgrounds to participate in and enjoy movement.

As this chapter continues, the following sections will explore how schools, families, and communities can support children in maintaining an active lifestyle and examine the role of organized sports in promoting health and development.

Topic hierarchy

17.6.1: The Role of Schools

17.6.2: Physical Activity Outside of School

17.6.3: Organized Sports

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17.6.1: The Role of Schools

Learning Objectives

1. Differentiate between physical education, recess, and intramural activities in terms of structure and developmental benefits.
2. Analyze barriers and facilitators to implementing effective physical activity programs in school settings.
3. Summarize the components of whole-school models like CSPAP and discuss their impact on student health and wellness.

Given that children spend a large portion of their day in school, integrating physical activity into the school environment is essential for meeting daily physical activity guidelines and supporting overall development.

Physical Education

Physical education (PE) provides structured, curriculum-based opportunities for children to engage in physical activity while developing motor skills, physical literacy, and knowledge about healthy lifestyles. The Centers for Disease Control and Prevention (CDC, 2019) recommends that elementary schools provide at least 150 minutes of physical education (PE) per week. High-quality PE programs are developmentally appropriate and aligned with national or state standards. However, not all schools meet these guidelines due to constraints such as funding, staffing, and scheduling priorities (Shape America, 2016).

Historically, physical education was viewed primarily as a means of improving athletic ability and physical fitness. Over time, particularly in response to growing concerns about childhood obesity and sedentary lifestyles, physical education (PE) has increasingly been recognized as an essential component of public health promotion. Modern physical education curricula aim not only to improve fitness but to cultivate skills and confidence in a variety of physical activities, encourage lifelong physical activity, and address health disparities (Pate et al., 2006).



Figure 17.6.1.1: A girl running on a track field. Image by Laughlin Air Force Base is in the public domain.

Attitudes toward physical education (PE) among students can significantly impact their engagement and participation. Research indicates that students are more likely to enjoy and participate in physical education (PE) when it is inclusive, non-competitive, and focuses on personal improvement rather than performance comparison (Subramaniam & Silverman, 2007). A positive physical education (PE) environment that emphasizes effort, skill development, and enjoyment can foster long-term motivation to remain physically active. However, negative experiences, such as embarrassment, body shaming, or fear of failure, can contribute to student disengagement, especially among girls and students with lower physical ability or self-esteem.

To combat these issues, contemporary PE programs emphasize developmentally appropriate, inclusive instruction and the integration of health education. There has also been a shift toward evidence-based approaches, where physical education is strategically used to support not only physical health but also academic achievement and social-emotional competence.

Additionally, PE teachers are increasingly recognized as key players in whole-school health initiatives. As advocates for school-wide physical activity initiatives, they can influence policies, lead staff wellness programs, and support classroom teachers in integrating movement into lessons. The recognition of physical education as a public health intervention highlights its importance not only for individual student development but also for population-level health improvements.

Recess

Recess provides an opportunity for unstructured time for physical activity and social interaction. The CDC and SHAPE America recommend that elementary schools offer at least 20 minutes of recess per day, separate from physical education classes (CDC, 2019). Recess supports not only physical health but also cognitive functioning, as movement breaks help children focus and regulate behavior in the classroom. Opportunities for play and peer interaction during recess also promote social skills and emotional development. Unfortunately, in some schools, recess time is reduced or withheld as a form of punishment, a practice discouraged by professional organizations, such as the AAP Council on School Health (2013).

Intramural Activities



Figure 17.6.1.2. Intramural soccer. Image by the University of Hawaii-West O'ahu is licensed CC BY-ND 2.0.

Intramural sports and extracurricular physical activities provide additional opportunities for students to stay active before, during, or after school. Unlike competitive sports, **intramural programs** are generally non-competitive and inclusive, encouraging broad participation. These programs can help children discover new interests, build confidence, and develop a lifelong appreciation for movement. Participation in organized extracurricular activities is also associated with positive academic and behavioral outcomes (Fox et al., 2010). However, access to these programs can be unequal, with disparities based on factors such as school funding, location, and socioeconomic status.

Whole-School Models

Whole-school models, such as the Comprehensive School Physical Activity Program (CSPAP) framework, aim to embed physical activity throughout the school day and culture. CSPAP includes five components:

1. quality physical education,
2. physical activity during school (including recess and classroom movement),
3. physical activity before and after school,
4. staff involvement, and family and
5. community engagement (CDC, 2019).

These models emphasize collaboration across school roles to create an environment that encourages and supports physical activity holistically. Research shows that whole-school approaches can significantly increase physical activity levels and improve students' physical and mental health outcomes (Brusseau & Burns, 2016).

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17.6.2: Physical Activity Outside of School

Learning Objectives

1. Explain the benefits of unstructured play and natural environments for physical and mental health in middle childhood.
2. Identify how family routines and neighborhood environments influence children's physical activity levels.
3. Describe common barriers to physical activity outside of school.

While schools provide structured opportunities for physical activity, much of a child's daily movement occurs outside the classroom. Afternoons, weekends, and school breaks offer valuable time for children to engage in unstructured play, family-based activity, and community recreation—each of which plays a critical role in meeting the recommended 60 minutes of moderate-to-vigorous physical activity per day (U.S. Department of Health and Human Services [USDHHS], 2018).

Unstructured play—such as riding bikes, climbing trees, or playing tag—offers more than just physical benefits. It also promotes creativity and independence. One common form of physical play in middle childhood is **rough-and-tumble play**, which includes playful fighting, wrestling, and chasing. Although it may appear aggressive, this type of play supports social competence and physical coordination when children engage in consensual and respectful interactions (Pellegrini & Smith, 1998).

Playground and Natural Spaces

Community playgrounds are another vital resource for promoting physical activity. These shared spaces enable children to engage in activities such as climbing, jumping, swinging, and running—activities that help develop strength, balance, and cardiovascular endurance. Access to quality playgrounds is also linked to more frequent and sustained physical activity in children (Veitch et al., 2006). However, not all neighborhoods have safe or accessible playgrounds, and disparities in park quality can affect children's opportunities for active play.

Spending time in natural environments—such as forests, nature trails, creeks, or open green spaces—can provide rich opportunities for both physical activity and mental well-being. Nature-based activities, such as hiking or exploring wooded areas, not only meet physical needs but also enhance mood, reduce stress, and support attention restoration in children (Gill, 2014). Regular interaction with nature has been associated with higher physical activity levels and a greater variety of movement forms compared to indoor or built environments (Gray, 2011).



Figure 17.6.2.1. Natural playground. Image by Ron King is licensed CC BY-SA 3.0.

Family Lifestyles

Family and community involvement can also strongly influence a child's activity levels. Children whose families prioritize active lifestyles are more likely to participate in physical activities themselves. Walking or biking to school, going on hikes, playing at local parks, and attending community fitness events can promote healthy habits and strengthen family bonds (Beets et al., 2010). Access to sidewalks, bike paths, and safe neighborhood play areas is associated with greater physical activity levels among children, highlighting the importance of infrastructure and environmental supports (Davison & Lawson, 2006).

Challenges of Incorporating Physical Activity

Barriers to participation outside of school can include cost, transportation issues, inadequate supervision, or concerns about neighborhood safety. These barriers tend to disproportionately affect children from low-income households, contributing to disparities in physical activity levels among this population. Programs like after-school recreation centers or low-cost community sports leagues can help bridge this gap, but access remains inconsistent across communities.

Screen time and sedentary behaviors often compete with physical activity in children's free time. The American Academy of Pediatrics recommends limiting recreational screen time to no more than 1–2 hours per day for school-aged children (American Academy of Pediatrics [AAP], 2016). However, surveys consistently show that many children exceed this amount, contributing to reduced physical activity and potential health concerns.

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17.6.3: Organized Sports

Learning Objectives

1. Explain how organized sports contribute to children's physical, social, and emotional development.
2. Recognize common sports-related injuries in middle childhood and strategies for prevention.
3. Discuss the role of coaches in shaping children's experiences in organized sports.
4. Evaluate how trends such as e-sports are influencing children's engagement in physical activity.

Organized Sports

Organized sports are structured, adult-led physical activities that involve skill development, teamwork, and competition. For children in middle childhood (typically ages 6–12), participation in organized sports can provide significant benefits when the environment is supportive and developmentally appropriate. These programs are typically offered through schools, community recreation centers, clubs, or private organizations.

Common sports for this age group include soccer, basketball, baseball, softball, gymnastics, swimming, and martial arts (National Council of Youth Sports [NCYS], 2020). Entry into organized sports typically begins between the ages of 5 and 7, with non-competitive, skill-based play, while more formal and competitive leagues usually start around ages 8–10, depending on the sport and local context (Côté & Hancock, 2016). Early involvement helps children develop foundational motor skills, learn game rules, and practice cooperation.

Pros and Cons

A key benefit of organized sports is the opportunity for skill transfer. Movement patterns, strategic thinking, and social competencies acquired in one sport often apply to others. For example, footwork in soccer may benefit basketball performance, while skills such as teamwork and perseverance transcend the context of any single sport (Fraser-Thomas, Côté, & Deakin, 2005).

The primary goal of organized sports in middle childhood should be enjoyment, learning, and development, not merely competition or winning. Emphasizing fun and personal growth encourages continued participation, helping children develop a lifelong appreciation for physical activity. Overemphasis on performance or early specialization in one sport can lead to physical and emotional burnout, with some children withdrawing from sports altogether by adolescence (Jayanthi et al., 2013).



Figure 17.6.3.2: Community sports. Image by the Department of Defense is in the public domain.

A study on children’s sports in the United States (Sabo & Veliz, 2008) has found that factors such as gender, poverty, location, ethnicity, and disability can limit opportunities for children 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 provide their daughters with as much support as they do their sons. While boys rated their fathers as their biggest mentors who taught them the most about sports, girls rated coaches and physical education teachers as their key mentors. Sabo and Veliz also found that children in suburban neighborhoods had a much higher participation 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.[27]

Sports-related Injuries

While physical activity is essential for healthy development, organized sports carry a risk of injury, especially if practices are intense, unbalanced, or poorly supervised. Common injuries in middle childhood include sprains, strains, fractures, and overuse injuries, such as stress fractures or inflammation of the growth plates (DiFiori et al., 2014).

Children’s musculoskeletal systems are still developing, making them more susceptible to injuries when training loads exceed their capacity. Poor technique, insufficient rest, and pressure to perform can also increase the risk of injury. The American Academy of Pediatrics (2016) recommends ensuring proper conditioning, using age-appropriate equipment, limiting repetitive movements, and promoting multi-sport participation to reduce the risk of overuse injuries.

Parental and coach awareness, combined with injury prevention programs, can help create a safer sports environment. Education on warm-ups, cool-downs, hydration, and injury warning signs is also essential.

The Coach's Role

Coaches play a critical role in shaping children’s experiences in organized sports. A positive coaching approach—marked by encouragement, fairness, and attention to development—can boost children's confidence and motivation (Smoll & Smith, 2006). Coaches act not only as skill instructors but also as mentors, helping children manage and work towards goals, as well as through setbacks.



Figure 17.6.3.2. Effective coaches understand both child development and appropriate communication strategies for working with youth. Image by Scott Cook is licensed CC BY-NC 4.0.

Effective coaches understand child development and adapt their communication and expectations accordingly. Research suggests that children are more likely to stay engaged in sports when coaches prioritize enjoyment, teamwork, and skill improvement over winning (Gould et al., 2007).

Conversely, coaches who use punitive or overly competitive methods can contribute to stress, anxiety, and dropout. Therefore, training programs that promote positive coaching strategies and child-centered practices are essential to fostering a supportive sports climate (Knight et al., 2017). Armed with this knowledge, many organized sports programs are striving to improve their offerings of knowledge and resources to help community and parent volunteer coaches feel more confident and prepared in their roles.

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 report being 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.[29]



Figure 17.6.3.3: A group of boys playing video sports. Image by Gamesingear is licensed under CC BY-SA 3.0.

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CHAPTER OVERVIEW

18: Cognitive Development in Middle Childhood

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, which enables them to plan and work toward their goals. Additionally, they can process complex ideas, such as addition and subtraction, as well as cause-and-effect relationships.

18.1: Theories of Cognition

18.1.1: Piaget's Theory of Cognitive Development

18.1.2: Triarchic Theory of Intelligence

18.1.3: Howard Gardner's Theory of Multiple Intelligences

18.2: Language Development in the School-Age Child

18.2.1: Communication Disorders

18.2.2: Learning to Read

18.2.3: Bilingualism

18.3: Cognitive and Language Development Milestones

18.4: Intelligence

18.5: Cognitive Deficits and Giftedness

18.6: Learning Difficulties

18.7: Academics

18.7.1: The School Environment

18.7.2: Non-Cognitive Factors in Achievement

18.7.3: Impact of COVID-19

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SECTION OVERVIEW

18.1: Theories of Cognition

Theorists offer various perspectives on 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 of intelligence, and Gardner's theory of multiple intelligences. Lastly, you'll learn about the Information Processing Theory, which examines the cognitive functions of children during middle childhood.



Figure 18.1.1. Jean Piaget. Image from Foundation Jean Piaget is in the public domain.

Topic hierarchy

18.1.1: Piaget's Theory of Cognitive Development

18.1.2: Triarchic Theory of Intelligence

18.1.3: Howard Gardner's Theory of Multiple Intelligences

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18.1.1: Piaget's Theory of Cognitive Development

Learning Objectives

1. Summarize the main characteristics of Piaget's concrete operational stage.
2. Identify key cognitive skills developed during concrete operations.
3. Discuss how concrete operational thinking supports academic tasks and problem-solving.
4. Evaluate critiques of Piaget's stage theory.

Concrete Operational Thought

The concrete operational stage is the third stage in Piaget's theory of cognitive development. This stage, which spans from 7 to 11 years of age, 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. Their rules of thinking still seem very basic by adult standards and usually operate unconsciously. Still, they allow children to solve problems more systematically than before, and therefore to be successful with many academic tasks.



Figure 18.1.1.1: Children studying. Image by Masae is licensed under CC0.

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]

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

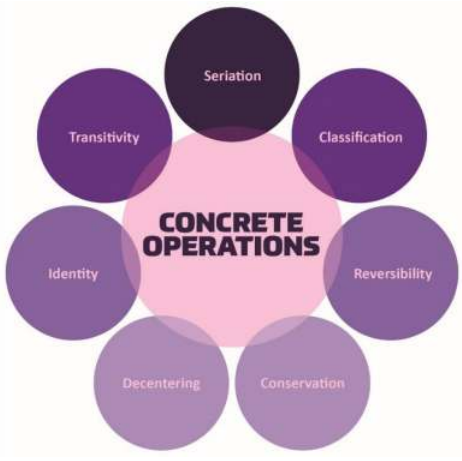


Figure **18.1.1.2**: The cognitive skills developed during the concrete operational stage. Image by Ian Joslin is licensed under CC BY 4.0.

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 18.1.1.3: Caption: Putting these rectangles from smallest to largest is seriation. Image by MehreenH is licensed CC BY-SA 4.0.

Classification

As children's experiences and vocabularies expand, they develop **schemas** and are able to organize objects in various ways. They also understand classification hierarchies and can categorize objects into various classes and subclasses.



Figure 18.1.1.4: This child might use classification if she sorts these toys by color. Image by tanyepm is licensed under CC0.

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 worksheets that explore reversible or irreversible situations.



Figure 18.1.1.5: Understanding that ice cubes melt is an example of reversibility. Image by John Voo is licensed under CC BY 2.0.

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 (such as 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.

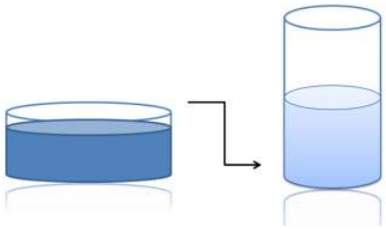


Figure 18.1.1.6: Beakers displaying the idea of conservation. Image by Ydolem2689 is licensed under CC BY-SA 3.0.

Decentration

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



Figure 18.1.1.7: Children looking at these glasses demonstrate decentration when looking at more than one attribute i.e. tall, short, and wide narrow. Image by Vinishachotlani1830587 is licensed under CC BY-SA 3.0.

Identity

One feature of concrete operational thought is the understanding that objects have qualities that remain constant even when the object is altered in some way. For instance, the mass of an object remains unchanged when it is rearranged. A piece of chalk remains chalk even when it is broken in two. [14]



Figure 18.1.1.8: A broken egg is still an egg. Image by John Liu is licensed under CC BY 2.0.



Figure **18.1.1.9**: A deflated balloon is still a balloon. Image is licensed under CC0.



Figure 18.1.1.10: Broken chalk is still chalk. Image by Viktoria Goda from Pexels.

Transitivity

Understanding 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 type of dog, then a boxer must also be a mammal.[18]



Figure 18.1.1.11: Transitivity allows children to understand that this boxer puppy is a dog and a mammal. Image by Martin Vorel is in the public domain.

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]

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18.1.2: Triarchic Theory of Intelligence

Learning Objectives

1. Differentiate between analytical, creative, and practical intelligence with relevant examples.

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 tasked with selecting graduate students for a psychology program. He was concerned that there was too much emphasis placed on aptitude test scores (which we will discuss later in the chapter). He believed that there were other, less easily measured, qualities necessary for success in a graduate program and 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 18.1.2.1: Reading supports analytical intelligence Image licensed under CC0.

Creative



Figure 18.1.2.2: Building with shows creative intelligence Image licensed under CC0.

Practical



Figure 18.1.2.3: Navigating social settings is practical intelligence Image by Steven Depolo is licensed under CC BY 2.0.

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18.1.3: Howard Gardner's Theory of Multiple Intelligences

Learning Objectives

1. Explain how Gardner's theory differs from traditional views of intelligence.
2. Identify and describe Gardner's nine proposed 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 possess different talents and skills. He proposed that there are nine intelligences that can be differentiated from one another.



Figure 18.1.3.1: Howard Gardner. Image by Interaction-Design.org is licensed under CC BY-SA 2.0.

Gardner contends that these are also forms of intelligence. A high IQ does not always guarantee success in life or necessarily indicate that a person possesses common sense, good interpersonal skills, or other essential abilities 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 18.1.3.1: Howard Gardner's Multiple Intelligences[1]

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 for 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 utilized these ideas to tailor their instruction to meet the needs of individual students. For instance, to teach math problems to students who have particularly strong kinesthetic intelligence, a teacher might encourage the students to move their bodies or hands in accordance with 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 consensus on the number of intelligences. Are a sense of humor, artistic skills, dramatic skills, and so forth also separate intelligences?[28]

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SECTION OVERVIEW

18.2: Language Development in the School-Age Child

Learning Objectives

1. Describe the key features of vocabulary development during middle childhood.
2. Identify how pragmatic language use evolves in middle childhood and why it is important for peer relationships.
3. Define metalinguistic awareness.
4. Describe the role of metalinguistic awareness in literacy development.
5. Discuss the connection between language development and executive functioning in school-aged children.

During middle childhood, language development continues to advance in both complexity and functionality. While the foundational elements of phonology, basic vocabulary, and sentence structure are typically established by early childhood, school-aged children make notable gains in higher-order language skills. These developments support their ability to engage in academic learning and social communication.

Vocabulary Development and Lexical Organization

Vocabulary expands rapidly during middle childhood, with children learning as many as 20 new words each day, largely through reading and academic exposure (Biemiller, 2005). By the fifth grade, a child's vocabulary has expanded to approximately 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 the ability to associate new words with those already known, and because semantic networks become more refined, making it easier to retrieve and use vocabulary appropriately across various contexts.

Children in this age group also develop a better understanding of multiple meanings of words (e.g., "bat" as an animal and a sports object) and begin to appreciate figurative language, such as metaphors, idioms, and humor. These skills are essential for nuanced communication and literacy development.

Discourse Skills

Discourse refers to the ability to construct coherent, extended communication, whether through storytelling, explaining, or conversation. During middle childhood, children become significantly more skilled at organizing their thoughts in logical and structured ways. They improve in their use of cohesive devices such as conjunctions ("because," "although"), pronouns that clearly link to prior ideas, and narrative techniques like setting the scene and including relevant details (Nippold, 2007).

Storytelling becomes more elaborate, with children integrating plot, characters, conflict, and resolution. They also learn to take the listener’s perspective into account, which reflects growth in both cognitive and social development. This ability to engage in connected, audience-sensitive discourse supports academic performance, particularly in reading and writing.

Pragmatics and Conversational Skills

Children refine their **pragmatic language skills**—how language is used in social contexts—during this period. They learn to interpret social cues, understand indirect requests (e.g., "Can you open the window?" as a request rather than a question), and adjust their language style according to the listener (e.g., speaking more formally to a teacher than to a friend). These developments support successful peer interactions and are closely tied to advances in theory of mind.



Figure 18.2.1. Whispering to share private information is an example of pragmatics in social conversations- that some information is not intended for all individuals. Image by ChrisGoldNY is licensed CC BY-NC 2.0.

Metalinguistic Awareness

A hallmark of language development in middle childhood is **metalinguistic awareness**—the ability to think about and reflect on language itself. Children become more aware that words are symbols that can be manipulated and analyzed. For example, they begin to understand and play with puns, recognize grammatical errors, and distinguish between literal and intended meanings.

Metalinguistic skills are particularly important for learning to read and write effectively. Children with strong metalinguistic awareness are better at recognizing when they misunderstand something, checking their comprehension, and correcting language errors (Gombert, 1992). This contributes to overall academic success and supports the development of effective learning strategies.

Language and Executive Function

Language and executive function skills are deeply intertwined in middle childhood. As children gain better control over attention, inhibition, and working memory, they become more capable of self-regulating their language production. This means they can pause to organize their thoughts, revise what they say mid-sentence, and use internal language (private speech) to guide their thinking and behavior—skills that are especially useful in problem-solving and learning environments (Vygotsky, 1986; Zelazo & Carlson, 2012).

Topic hierarchy

18.2.1: Communication Disorders

18.2.2: Learning to Read

18.2.3: Bilingualism

References, Contributors and Attributions

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18.2.1: Communication Disorders

Learning Objectives

1. Define communication disorders.
2. Identify common characteristics and examples of speech, language, and social (pragmatic) communication disorders in middle childhood.
3. Recognize how communication disorders may affect academic performance and peer relationships.
4. Explain the importance of early identification and describe the roles of professionals in supporting children with communication disorders.

Some children face significant challenges in this area due to communication disorders, which can affect their ability to understand or express language and impact their social and academic success.

What are Communication Disorders?

Communication disorders are conditions that impair a child's ability to receive, send, process, or comprehend verbal, nonverbal, and written messages. These disorders may be developmental or acquired and can involve speech, language, or both. According to the American Speech-Language-Hearing Association (ASHA), communication disorders in children may include:

Speech Disorders

Speech disorders involve difficulties with the physical production of sounds. These include:

- **Articulation disorders**, where children have trouble producing speech sounds correctly (e.g., saying "wabbit" instead of "rabbit").
- **Fluency disorders**, such as stuttering, involve disruptions in the flow of speech.
- **Voice disorders**, where the pitch, volume, or quality of the voice is abnormal, are often due to misuse or physiological problems.

Children with speech disorders may be intelligible to some people but hard to understand for others, which can interfere with classroom participation and peer relationships.

Language Disorders

Language disorders affect how children understand (receptive language) and use (expressive language) words and sentences. These children may:

- Struggle to follow directions.
- Have a limited vocabulary for their age.
- Use short or grammatically incorrect sentences.
- Find it difficult to express thoughts clearly.

These disorders often overlap with literacy challenges, including reading and writing difficulties, especially as academic expectations increase during middle childhood (Catts et al., 2001).

Social (Pragmatic) Communication Disorder

Social (Pragmatic) Communication Disorder (SCD) is a more recently defined condition, recognized in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5). SCD affects a child's ability to use language appropriately in social contexts. It is not about speech sound production or grammar, but about understanding *how*, *when*, and *why* to communicate effectively.

Children with SCD may:

- Have trouble taking turns in conversation.
- Miss social cues like body language or tone of voice.
- Struggle to adjust language depending on the context (e.g., talking to a teacher versus a friend).
- Find it hard to follow the rules for storytelling or conversation.

These challenges are distinct from autism spectrum disorder (ASD) because SCD does not include repetitive behaviors or restricted interests. However, it can look similar in some ways, making diagnosis and support planning essential (Adams et al., 2012).

SCD can significantly impact a child's ability to form relationships, navigate group settings, and participate effectively in classroom discussions and group work.

Prevalence and Identification

Communication disorders are among the most common developmental concerns in school-aged children. The Centers for Disease Control and Prevention (CDC) reports that approximately 7.7% of U.S. children aged 3–17 have a diagnosed speech or language disorder (Black et al., 2015). Many of these children continue to experience challenges into middle childhood, especially as language demands increase in school settings.

Teachers, speech-language pathologists (SLPs), and other professionals play an essential role in identifying children with communication difficulties. Early identification is key to effective intervention. Common indicators in middle childhood include limited vocabulary, difficulty following directions, challenges with storytelling or classroom participation, and noticeable frustration during communication attempts.



Figure 18.2.1.1. A child uses a tablet to help her communicate. Image by NIH Image Gallery is licensed CC BY-NC 2.0.

Impact on Development

The effects of communication disorders can be wide-ranging. Children with these disorders often struggle with reading and writing, which can hinder academic achievement (Catts, Fey, Zhang, & Tomblin, 2001). Socially, they may struggle to form and maintain friendships due to miscommunications or social withdrawal (Snow, 2009). These challenges can also lead to lower self-esteem and behavioral issues over time if not adequately addressed.

Supporting Children with Communication Disorders

A multi-tiered support system is recommended to assist children with communication disorders. This may include:

- **Speech and language therapy** is provided by qualified SLPs to target specific areas of need.
- **Classroom accommodations** include visual aids, simplified instructions, or extra time for verbal responses.
- **Inclusive practices** that promote peer interaction and reduce stigma.
- **Family involvement**, as parents and caregivers, can reinforce language skills at home through reading and engaging in conversations.

Early childhood professionals, educators, and caregivers must foster environments that support communication development and promote early referral when concerns arise. With timely and appropriate interventions, many children with communication disorders can make significant progress.

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18.2.2: Learning to Read

Learning Objectives

1. Describe the phonics-based and whole-language approaches to reading instruction.

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 distinguished by their methodology; however, today's models of reading strive for a balance between the two types of reading methods, as both are 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** aims to teach reading naturally and intuitively. 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]

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18.2.3: Bilingualism

Learning Objectives

1. Define bilingualism.
2. Explain the concept of cumulative vocabulary.
3. Identify cognitive, academic, and social benefits associated with bilingualism.
4. Compare common models of bilingual education and their goals.
5. Discuss how language connects to culture and identity in bilingual children.

Bilingualism and Bilingual Education

Although monolingual speakers—those who speak only one language—often do not realize it, the majority of children around the world are bilingual. These children understand and use two languages across different contexts (Meyers-Sutton, 2005). Even in the United States, which has historically been a relatively monolingual society, more than 47 million people speak a language other than English at home. Of these, approximately 10 million are children and youth enrolled in public schools (United States Department of Commerce, 2003). While the majority of bilingual students in the U.S. are Hispanic, more than a hundred different languages are spoken by children in classrooms across the country.

In these diverse communities, it is increasingly common for a single classroom to include students from multiple language backgrounds. Bilingualism exists in various forms and degrees, and understanding this diversity is crucial for supporting equitable and inclusive learning environments.

Understanding Bilingualism

Types of Bilingualism

Not all bilingual children develop their language skills in the same way. Researchers often distinguish between:

- **Simultaneous bilinguals**: Children who learn two languages from birth or early infancy.
- **Sequential bilinguals**: Children who learn a second language after the first language is well established.

Children also vary in **language dominance**. Some are equally fluent in both languages (balanced bilinguals), while others may be stronger in one language, depending on exposure and use at home, school, or in the community.

Cumulative Vocabulary

Bilingual children may seem to have smaller vocabularies in each individual language compared to monolingual peers. However, this does not mean they are behind. When both languages are considered together, their **total or cumulative vocabulary** is often equal to or greater than that of monolingual children (Pearson, Fernández, & Oller, 1993). For example, a bilingual child may know household-related words in Spanish and school-related words in English. These language-specific vocabularies reflect the environments in which each language is used.

Recognizing cumulative vocabulary is essential in educational settings. Without this understanding, bilingual children may be misidentified as having language delays. Educators and specialists should assess vocabulary across both languages to gain a more accurate picture of a child's language development (Bedore, Peña, Garcia, & Cortez, 2005).

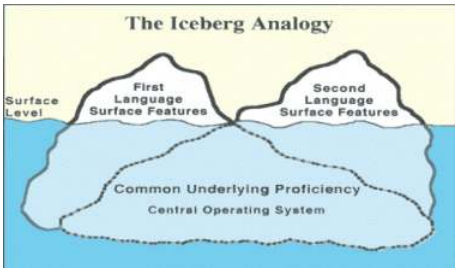


Figure 18.2.3.1: The Iceberg Analogy. Image by LEAP is licensed under the Free Art License. [58]

Benefits of Bilingualism

Bilingualism provides significant cognitive, academic, and social advantages. Fluent bilingual individuals often have stronger **executive functioning** skills, such as working memory, cognitive flexibility, and attentional control (Bialystok, 2001). These abilities support problem-solving, multitasking, and creative thinking.

Bilingual children also demonstrate greater **metalinguistic awareness**, or an understanding of how language works (Jimenez, Garcia, & Pearson, 1995). This means they can more easily understand concepts like word meaning, grammar, and language differences.

Furthermore, a strong foundation in a first language (L1) can support second language (L2) learning, especially when children transfer skills like vocabulary and storytelling across languages (Hansen, Umeda, & McKinney, 2002).

Bilingual Education Approaches



Figure **18.2.3.2**. Three children tinker with small objects. Image by Bakken Museum via Minneapolis2040 is licensed CC BY-SA 2.0.

There is no one-size-fits-all approach to educating bilingual children. Schools in the United States implement various instructional models depending on the needs of their students, resources, and community demographics. Five common approaches include:

- **Immersion Programs**
  In immersion settings, instruction is provided entirely in English, with the goal of rapid second language acquisition. These programs do not use the child's home language, which can be difficult for students who lack English proficiency and support in maintaining their first language.
- **ESL Pull-Out Programs**
  In ESL (English as a Second Language) pull-out programs, students leave the general education classroom for part of the day to receive specialized English instruction. While this model helps with English development, it may not support continued growth in the home language or content learning in the mainstream classroom.
- **Transitional Bilingual Education**
  Transitional programs begin with instruction in the student's home language and gradually shift to English. The goal is to transition students to English-only classrooms while using the home language as a bridge. These programs focus on English acquisition rather than long-term bilingualism.
- **Developmental Bilingual Education**
  Also known as maintenance bilingual education, this approach promotes long-term development of both the home language and English. Instruction occurs in both languages over several years, supporting biliteracy and cultural identity.
- **Two-Way Immersion Programs**
  Two-way immersion (or dual-language immersion) programs bring together native English speakers and speakers of another language in one classroom. Instruction is split between the two languages, and all students are expected to become bilingual and biliterate. These programs have been shown to support high academic achievement and foster respect for linguistic and cultural diversity.

Effective bilingual education models share key features: they are culturally inclusive, linguistically supportive, and implemented by trained educators who value students' diverse backgrounds.

Culture, Identity, and Language

Language is more than a communication tool—it is deeply connected to a child's identity, relationships, and worldview. For bilingual children, their heritage language often serves as a vital link to family and cultural traditions.



Figure 18.2.3.3. Children who are encouraged to use and develop their family's native language tend to have higher self-esteem and cultural pride. Image by Province of British Columbia is licensed CC BY-NC-ND 2.0.

Maintaining the home language supports strong family connections and a positive self-concept. Research shows that children who are encouraged to use and develop both languages tend to show higher self-esteem and cultural pride (Krogstad & Gonzalez-Barrera, 2015). In contrast, when a child's home language is discouraged, they may feel pressured to suppress part of who they are, which can lead to confusion about identity and a sense of exclusion.

Educational practices that respect and promote bilingualism affirm children's identities and foster environments where all students feel seen, valued, and included.

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18.3: Cognitive and Language Development Milestones

Learning Objectives

1. Identify cognitive and language milestones, by age, in middle childhood.

Cognitive Milestones in Middle Childhood

Table **18.3.1**. Cognitive Milestones

Age Range	Milestones
6-7 years	• Improved attention span • Begins using logic to solve concrete problems
8-9 years	• Can think more logically about concrete events • Better understanding of cause and effect, including reversibility to understand possible causes inferred from the effects
10-12 years	• Develops abstract thinking • Understand hypothetical, deductive and inductive reasoning

Language Milestones in Middle Childhood

Table **18.3.2**. Language Milestones

Age Range	Milestones
6-7 years	• Understands and uses complex sentences • Improvements in reading and writing
8-9 years	• Vocabulary expands ◦ Receptive vocabulary (words they understand) is approximately 10,000-12,000 ◦ Expressive vocabulary (words they actively use in speaking and writing) is around 5,000-7,000 (Owens, 2016) • Begins to understand figurative language and multiple meanings
10-12 years	• Uses more advanced grammar and sentence structures • Strong reading comprehension

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18.4: Intelligence

Learning Objectives

1. Explain how intelligence is measured and the meaning of IQ scores.
2. Identify key contributors to intelligence testing and describe their tests (e.g., Binet, Terman, Wechsler).
3. Discuss the Flynn effect and its implications for intelligence testing over time.
4. Evaluate the uses and limitations of IQ tests, including concerns about cultural bias and variability in definitions of intelligence.
5. Interpret the normal distribution of IQ scores and its relevance to identifying intellectual disability and giftedness.

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**, which means that they accurately measure intelligence rather than some other attribute. 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 assessments.

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 administering it to a large number of people across different age groups 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. We can calculate a person's **mental age**, which represents the intellectual age at which a person is performing. If we compare a person's mental age to their chronological age, the result is the **Intelligence Quotient (IQ)**, a measure of intelligence adjusted for age. A simple way to calculate IQ is by using the following formula:

IQ = mental age ÷ chronological age × 100.

Thus, a 10-year-old child who does as well as the average 10-year-old child has an IQ of 100 (10 ÷ 10 × 100), whereas an 8-year-old child who does as well as the average 10-year-old child would have an IQ of 125 (10 ÷ 8 × 100). Most modern intelligence tests are based on the relative position of a person's score among people of the same age, rather than on the basis of this formula, but the idea of intelligence "ratio" or "quotient" provides a good description of the score's meaning.

The Flynn Effect

It is important that intelligence tests be standardized regularly, as 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 several explanations for the Flynn effect, including improved nutrition, increased access to information, and greater 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 appear to be experiencing learning difficulties or severe behavioral problems can be tested to determine whether their difficulties can be partly attributed to an IQ score that is significantly different from the mean for their 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 to 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.

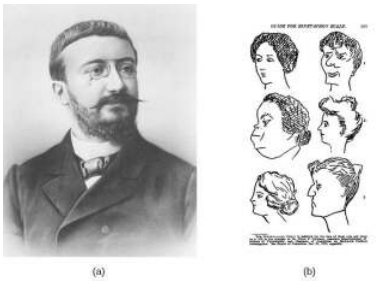


Figure 18.4.1: Alfred Binet (b). This page is from a 1908 version of the Binet-Simon Intelligence Scale. The children being tested were asked which face, in each pair, was prettier. Images are in the public domain.

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, which became known as the ***Stanford-Binet Intelligence Test***. The Stanford-Binet is a measure of general intelligence that comprises a wide variety of tasks, including vocabulary, memory for pictures, naming 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 intelligence quotient (IQ) test in the United States. Wechsler combined several subtests from other intelligence tests used between 1880 and World War I. These subtests assessed a variety of verbal and nonverbal skills, as 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 18.4.2: David Wechsler. Image by Comet Photo AG (Zürich) is licensed under CC BY-SA 4.0.

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 widely used in schools and communities throughout the United States and 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 intelligent varies culturally as well, and most intelligence tests do not account for this variation. For example, in the West, being smart is associated with being quick. A person who answers a question the fastest is often perceived as the smartest, but in some cultures, being smart is associated with considering an idea thoroughly before providing 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 majority of scores cluster around the middle, with fewer scores occurring at the extremes. The normal distribution of intelligence indicates that, on IQ tests and most other measures, the majority of people cluster around the average (in this case, where IQ = 100). At the same time, fewer individuals are either exceptionally intelligent or exceptionally dull (see below).

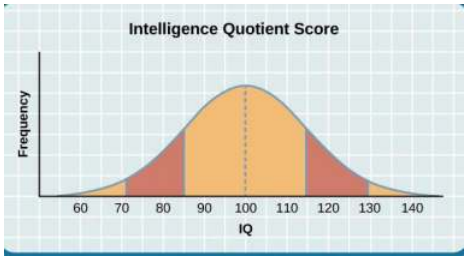


Figure 18.4.3: The majority of people have an IQ score between 85 and 115. Image by CNX Psychology is licensed under CC BY 4.0.

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 considered the threshold for an intellectual disability.

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18.5: Cognitive Deficits and Giftedness

Learning Objectives

1. Define intellectual disability.
2. Describe how societal attitudes and language use around intellectual disabilities have changed over time.
3. Explain what giftedness is and discuss both benefits and challenges associated with high IQ.
4. Differentiate between achievement tests and aptitude tests and provide examples of each.
5. Summarize the history and impact of educational policies such as No Child Left Behind and the Every Student Succeeds Act (ESSA).

Intellectual Disabilities

People with very low IQs define one end of the distribution of intelligence scores. **Intellectual disability** (also known as **intellectual developmental disorder**) is assessed based on cognitive capacity (IQ) and adaptive functioning. The severity of the disability is based on adaptive functioning, which refers to 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 eyes, a protruding tongue, and a short neck.



Figure 18.5.1: Down Syndrome is caused by the presence of all or part of an extra 21st chromosome. Image by Vanellus Foto is licensed under CC BY-SA 3.0.

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; however, there may also be challenges associated with being particularly intelligent. 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 18.5.2: Children who get a score on an intelligence test showing an IQ of 130 or higher are labeled as gifted. Image by Ben Mullins on Unsplash.

As you might expect based on our discussion of intelligence, there are also different types and areas of intelligence and giftedness. Some children excel in math or science, while others are skilled in automobile repair or carpentry, or in music or art, or in 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 gifted kids (Colangelo & Assouline, 2009), it may also 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 examine the various types of tests and the subjects being tested.

Testing in Schools

Children's academic performance is often assessed using standardized tests. Those tests include, but are not limited to, achievement and aptitude tests.



Figure 18.5.3: Standardized tests are used to measure academic performance. Image by Marine Corps Base Hawaii is in the public domain.

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 six 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 is 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 classes, 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 heavily on testing as the sole indicator 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 18.5.4: The No Child Left Behind Act was signed into effect in 2001. Image is in the public domain.



Figure 18.5.5: The Every Student Succeeds Act was signed into effect in 2015. Image is in the public domain.

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 high school graduation rates, dropout rates, and college attendance.[48]

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18.6: Learning Difficulties

Learning Objectives

1. Differentiate between learning disorders and learning disabilities.
2. Identify common types of learning disorders.
3. Describe the purpose and protections offered by Section 504, the ADA, and IDEA.

Learning Disorder vs. Disability

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 specific criteria.
- A **learning disability** is a problem 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 professional will make a diagnosis, identify the causes, and develop 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, including detailed specifications 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]



Figure 18.6.1: Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. Image by pan xiaozhen on Unsplash.

Summary of Learning Disabilities and Disorders

Table 18.6.1: Summary of Learning Disabilities[1]

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

Children with Disabilities: Legislation

Since the 1970s, political and social attitudes have moved increasingly toward including people with disabilities in a wide variety of "regular" activities. In the United States, the shift is clearly illustrated in the Federal legislation 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 explicitly intended 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, they are not allowed to exclude children or youths with disabilities, and they must 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 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, such as wheelchair-accessible doors, ramps, and restrooms, as well as public telephones with volume controls.



Figure 18.6.2: President George H. W. Bush Signs the Americans with Disabilities Act, 07/26/1990. Image is in the public domain.

Individuals with Disabilities Education Act (IDEA)

As its name implies, 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 individuals with disabilities 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 cases of disagreements between an individual with a disability and the school or other professionals, there must be procedures for resolving the disagreements that are fair and accessible to all parties, including the individual themselves or their 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 individuals with disabilities should provide as many educational opportunities and options 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 whenever possible.
- **An Individualized Educational Plan (IEP):** Since every disability is unique, instructional planning for individuals with disabilities should also be unique or individualized. 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]

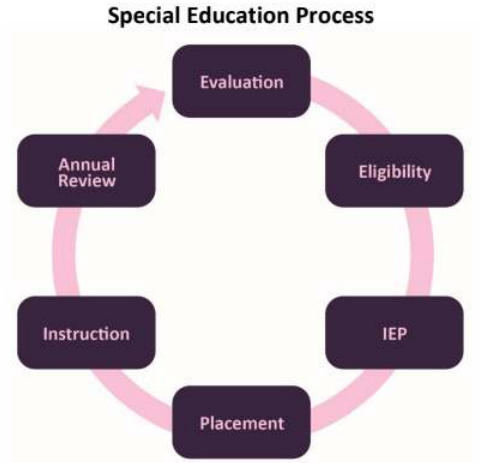


Figure 18.6.3: The special education process- evaluation, eligibility, IEP, placement, instruction, and annual review. Image by Ian Joslin is licensed under CC BY 4.0.

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SECTION OVERVIEW

18.7: Academics

Academic success during these years is shaped by more than just intelligence or knowledge. Children's performance is influenced by a combination of factors, including the **quality of the school environment**, **non-cognitive traits** such as motivation and self-regulation, and **external circumstances**, such as global events or family disruptions.

In the following sections, we will examine how these elements interact to support—or sometimes challenge—children's learning. We will examine the role of teachers and classroom climate, consider how social-emotional factors contribute to student achievement, and assess how recent events, such as the COVID-19 pandemic, have impacted learning outcomes during this formative period.

Topic hierarchy

18.7.1: The School Environment

18.7.2: Non-Cognitive Factors in Achievement

18.7.3: Impact of COVID-19

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18.7.1: The School Environment

Learning Objectives

1. Explain how teacher-student relationships influence academic and emotional outcomes in middle childhood.
2. Describe the role of classroom climate in shaping children's engagement and behavior.
3. Summarize the effects of class size on learning.
4. Evaluate the benefits and drawbacks of ability grouping in elementary education.
5. Identify the risks and considerations associated with grade retention.

During middle childhood, school becomes a central arena for personal and social development. Children spend more time in school than in any other structured environment, and what happens within school walls can have a lasting impact on their academic achievement and overall development. While curriculum matters, so does the setting in which it's delivered. The school environment includes the relationships, teaching practices, classroom structure, and policies that shape learning on a day-to-day basis.

Teacher-Student Relationships

Strong teacher-student relationships support children's academic growth and emotional well-being. When children feel seen, valued, and supported by their teachers, they are more likely to participate in class, persevere through challenges, and develop a positive attitude toward school (Hamre & Pianta, 2001). These relationships are especially important for students who may lack consistent support at home.

Classroom Climate

The classroom climate—the emotional and social atmosphere created by the teacher and students—affects how safe and motivated children feel. A positive climate is characterized by respect, cooperation, clear routines, and opportunities to collaborate. In contrast, a classroom with frequent disruptions, punitive discipline, or unclear expectations can lead to disengagement and an increase in behavioral issues (Pianta, La Paro, & Hamre, 2008).



Figured 18.7.1.1. Creating a positive classroom culture. Image by UCSD Jacobs School of Engineering is licensed CC BY-NC 3.0.

Class Size

Smaller class sizes are generally associated with better academic outcomes, particularly in the early grades. In smaller classrooms, teachers are better able to provide individualized attention, adapt instruction to students' needs, and manage classroom behavior (Finn & Achilles, 1999). Research from the Tennessee STAR project found that students in smaller classes (13–17 students) performed better in reading and math than those in regular-sized classes, with the benefits being particularly strong for students from low-income families (Krueger, 1999).

While class size effects may taper off in upper elementary grades, small classes remain beneficial for teachers trying to support students with diverse learning needs.

Academic Expectations

High—but—realistic academic expectations are linked to higher student achievement. When teachers believe their students are capable of success, they tend to provide more encouragement, opportunities, and meaningful feedback (Jussim & Harber, 2005). These expectations influence students' own beliefs about their abilities—a phenomenon known as the **Pygmalion effect**. However, low expectations, whether implicit or explicit, can limit learning, especially for students from marginalized groups.

Clear academic goals and developmentally appropriate challenges can foster a sense of competence, motivating children to persist in the face of setbacks.

Ability Grouping

Ability grouping, also known as tracking, involves placing students into instructional groups based on their perceived skill levels. This is a common practice in elementary schools, especially for reading and math.

There is debate about the long-term effectiveness of ability grouping. On the one hand, it can allow teachers to tailor instruction more closely to students' skill levels. On the other hand, students placed in lower groups may receive less rigorous instruction and fewer enrichment opportunities, which can reinforce existing gaps in achievement over time (Gamoran, 2009). Grouping strategies are most effective when they are flexible and regularly reassessed, rather than being fixed for extended periods.

Grade Retention

Grade retention—having a student repeat a grade—is another controversial practice. While intended to give children extra time to catch up academically or mature socially, retention is linked with increased risk of academic disengagement, lower self-esteem, and school dropout in later years (Jimerson, 2001). Studies suggest that providing targeted academic support and differentiated instruction is more effective than retention alone.

The decision to retain a student should involve a holistic assessment of academic skills, emotional readiness, and available interventions, rather than relying solely on test scores or age.

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18.7.2: Non-Cognitive Factors in Achievement

Learning Objectives

1. Define self-control and self-regulation.
2. Describe how motivation and resilience influence academic engagement and persistence.
3. Distinguish between growth and fixed mindsets.
4. Identify gender-related trends in academic performance and discuss contributing factors.

Academic achievement in middle childhood is not solely determined by intelligence. A growing body of research indicates that noncognitive factors—such as self-regulation, motivation, mindset, and social-emotional development—play a significant role in children's academic performance. These traits affect how children approach learning, respond to setbacks, and persist through challenges.

Self-Control and Self-Regulation

Self-control is the ability to manage attention and behavior in order to achieve long-term goals. In school settings, self-control helps students stay focused during lessons, resist distractions, wait their turn, and complete tasks (Duckworth & Seligman, 2005). It's closely related to **self-regulation**, which includes planning, goal-setting, and emotional regulation.

Children who show strong self-control tend to have better academic outcomes, even when controlling for IQ. In fact, studies suggest that self-discipline may be a stronger predictor of school success than intelligence (Duckworth & Carlson, 2013).

Motivational Resilience and Vulnerability

Motivation refers to the internal drive that prompts individuals to achieve their goals and engage in learning. Some children exhibit **motivational resilience**—a tendency to persevere through difficulty, view failure as a learning opportunity, and remain engaged even when tasks are challenging.

Others may be more **motivationally vulnerable**, meaning they are more likely to give up when faced with setbacks, especially if they have experienced repeated academic struggles. Motivation is influenced by past experiences, feedback from adults, peer comparison, and classroom climate (Skinner, Kindermann, & Furrer, 2009).

Creating supportive classroom environments that celebrate effort and progress, rather than only performance, can help buffer vulnerability and promote long-term engagement.

Growth vs. Fixed Mindset

Mindset—the beliefs children hold about their own abilities—has a significant influence on motivation and academic behaviors. According to Dweck (2006), children with a growth mindset believe that intelligence and abilities can be improved through effort and practice. They are more likely to embrace challenges, persist in the face of failure, and learn from feedback.

In contrast, children with a fixed mindset believe their abilities are unchangeable. When faced with difficulty, they may avoid tasks, fear failure, or assume they "just aren't smart." Teachers can foster a growth mindset by praising effort, teaching that the brain grows through learning, and encouraging risk-taking in learning tasks.

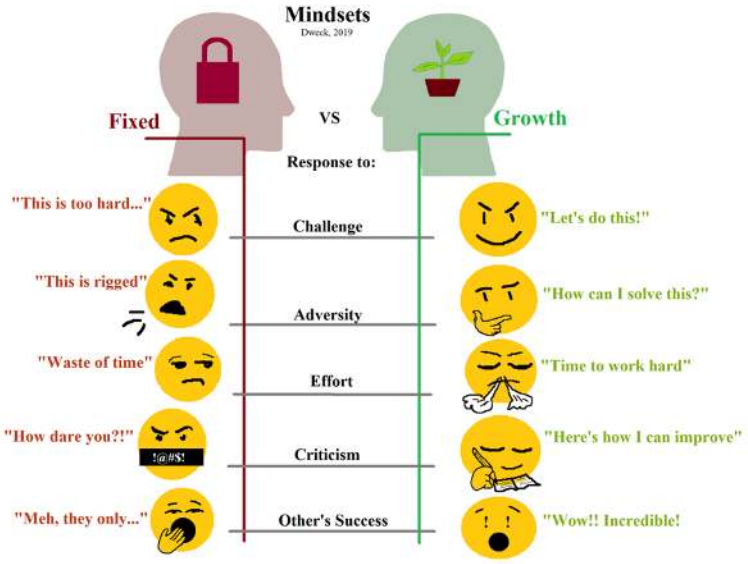


Figure 18.7.2.1. Fixed vs. growth mindset indicators in response to challenge, adversity, effort, criticism, and others' success. Image by Wikimedia Commons User U3170151 is licensed CC BY-SA 4.0.

Gender and Academic Performance

Gender differences in academic outcomes begin to appear in middle childhood. On average, girls tend to outperform boys in reading and writing, while boys are more represented at both the high and low ends of mathematics performance (Robinson & Lubienski, 2011). These differences are influenced by biological, social, and cultural factors.

Boys may struggle more with self-regulation and classroom behavior, while girls may experience higher rates of academic anxiety or perfectionism. Teachers' expectations and gender stereotypes can also shape students' self-perceptions and achievement patterns. Recognizing and addressing these patterns helps ensure that both boys and girls receive the support they need to succeed.

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18.7.3: Impact of COVID-19

Learning Objectives

1. Describe the academic and developmental disruptions experienced by children during the COVID-19 pandemic.
2. Identify key factors that contributed to learning loss and inequitable outcomes in remote learning.
3. Summarize current strategies schools and communities are using to support academic and emotional recovery.

The COVID-19 pandemic brought unprecedented changes to children's education, particularly during the early months of school closures in 2020 and the following years of interrupted or altered instruction. For children in middle childhood—an age marked by rapid growth in academic, social, and emotional development—these disruptions had widespread and often unequal effects.



Figure 18.7.3.1. Students wearing masks. Image by Yan Krukau is licensed by Pexels.

Learning Loss and Academic Delays

One of the most widely reported impacts of the pandemic was **learning loss**—a measurable decline in academic progress compared to pre-pandemic expectations. National and international studies indicate that students, on average, tend to fall behind in both reading and mathematics, with math losses often exceeding those in literacy (Kuhfeld et al., 2022).

These delays were most pronounced among younger students, children from low-income families, English language learners, and those without reliable internet or access to devices during remote learning. The shift to online education revealed and widened existing inequities in educational opportunity.

Remote Learning Challenges

Middle childhood is a time when children are still developing self-regulation skills and often rely on adult support to maintain focus and organization. During remote learning, many students struggled with:

- Limited access to devices or reliable internet
- Fewer opportunities for direct interaction with teachers
- Reduced peer engagement and classroom structure
- Increased distractions in home environments

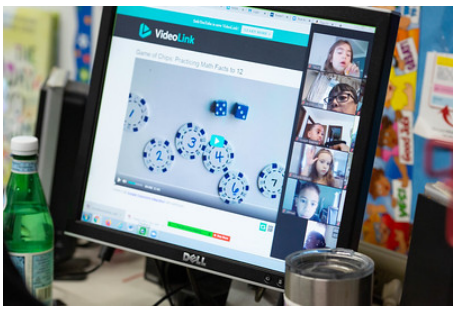


Figure 18.7.3.2. Close-up of a teacher's computer monitor sharing a second-grade math lesson to students learning remotely during the COVID-19 pandemic. Image by Alliance for Excellent Education is licensed CC BY-NC 2.0.

For children without strong parental support or structured routines at home, these challenges were especially significant. Research suggests that students in elementary grades were more negatively affected by remote instruction than older students, who are typically more independent (Hammerstein et al., 2021).

Social-Emotional and Behavioral Impacts

Beyond academics, the pandemic also disrupted children's emotional development. Isolation from peers, increased stress at home, and anxiety about the virus contributed to increases in behavioral issues, attention difficulties, and mental health concerns (Loades et al., 2020).

Many children returning to in-person learning had to readjust not only academically but also socially, relearning how to navigate group work, classroom expectations, and peer relationships. These factors often compounded the challenges of catching up academically.

Recovery and Moving Forward

Schools and communities have responded with efforts to accelerate learning and address social-emotional needs. These include:

- **Expanded tutoring programs** and after-school support
- **Summer learning programs** targeting core skills
- **Increased mental health services** in schools
- **Trauma-informed teaching practices** and social-emotional learning (SEL) curricula

Experts emphasize that academic recovery must go hand in hand with attention to children's mental health and family well-being. While the full impact of COVID-19 on academic trajectories is still unfolding, it is clear that rebuilding learning environments that are equitable, supportive, and flexible is essential for long-term success.

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CHAPTER OVERVIEW

19: Social and Emotional Development in Middle Childhood

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.

19.1: Social Emotional Theories of Development
19.2: The Self and Identity in Middle Childhood
19.2.1: Self-Concept vs. Self-Esteem
19.2.2: Gender Identity
19.2.3: Ethnic and Racial Identity
19.2.4: Motivation as Self-Efficacy
19.3: Emotional Development and Challenges
19.3.1: Fear and Anxiety
19.3.2: Sadness and Depression
19.3.3: Anger and Aggression
19.4: Family Relationships
19.4.1: Siblings and Only-Children
19.4.2: Diverse Families
19.5: Peer Relationships
19.5.1: Friendships
19.5.2: Social Status
19.5.3: Bullying
19.6: Stress, Coping and Resiliency

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19.1: Social Emotional Theories of Development

Learning Objectives

1. Summarize social emotional theories (as previously shared in the text) as they relate specifically to development in middle childhood.

Erikson's Industry vs. Inferiority

Erik Erikson's theory of psychosocial development is one of the most widely used frameworks for understanding the social and emotional growth of children. In middle childhood, children navigate the fourth stage of Erikson's model: **Industry vs. Inferiority** (Erikson, 1963). During this stage, children strive to demonstrate competence in valued skills and tasks, especially in school settings. Success leads to a sense of industry and confidence, while repeated failure or lack of encouragement can foster feelings of inferiority. This stage emphasizes the importance of supportive environments that enable children to experience mastery and receive recognition for their efforts.

> ***Example**: A child who is praised for their ability to solve math problems is likely to feel industrious, whereas a child who consistently struggles without support may begin to feel inferior compared to peers.*



Figure 19.1.1: The academic award this boy is receiving may contribute to his sense of industry. Image by Janarthanan kesavan is licensed under CC BY-SA 4.0.

Social Learning Theory

Albert Bandura's **Social Learning Theory** emphasizes the role of observational learning, modeling, and reinforcement in social development (Bandura, 1977). During middle childhood, peer relationships become increasingly important, and children often look to peers and adults as models for appropriate emotional expression and cooperative behavior. Self-efficacy, or one's belief in one's competence, also becomes increasingly important in guiding behavior and emotional well-being (Bandura, 1986).

> ***Example**: A child might learn to manage frustration by observing a classmate use deep breathing techniques during a difficult task.*

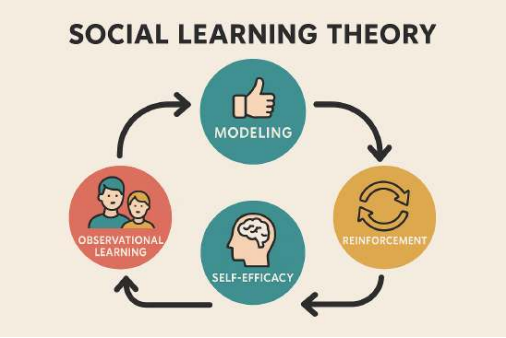


Figure 19.1.2: Process cycle representative of social learning theory. AI-generated image by Heather Carter is licensed CC BY-SA 4.0

Theory of Moral Development

Lawrence Kohlberg built upon Piaget's work to describe the stages of moral reasoning development. Most children in middle childhood are in the **conventional level** of moral development, particularly the **"good boy/good girl" orientation**, where behaviors are guided by the desire to gain approval and maintain social order (Kohlberg, 1981). This stage is critical in understanding how children learn to navigate friendships, fairness, and social rules.

> ***Example**: A child may return a lost item to a peer because they understand it is the "right" thing to do and want to be seen as a good person.*

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SECTION OVERVIEW

19.2: The Self and Identity in Middle Childhood

Children in middle childhood undergo significant developments in their understanding of self and identity. Compared to early childhood, when self-descriptions are often exaggerated and based on physical attributes (“I’m the fastest runner”), middle childhood is characterized by more realistic and multifaceted self-perceptions. These changes are the result of increasing cognitive maturity, greater social interaction, and exposure to cultural expectations and societal norms (Harter, 2012).



Figure \(\PageIndex{1}\). A young boy is running down the road. Image by sasint is licensed CC0 1.0.

Topic hierarchy

19.2.1: Self-Concept vs. Self-Esteem

19.2.2: Gender Identity

19.2.3: Ethnic and Racial Identity

19.2.4: Motivation as Self-Efficacy

References, Contributors and Attributions

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19.2.1: Self-Concept vs. Self-Esteem

Learning Objectives

1. Distinguish between self-concept and self-esteem.
2. Identify key domains that contribute to self-esteem during middle childhood.
3. Explain how social comparison influences children's self-perceptions and motivation.
4. Analyze the impact of media messages on children's body image and self-esteem.
5. Evaluate the outcomes of the self-esteem movement and identify effective ways to support healthy self-worth.

Self-Concept vs. Self-Esteem

Self-concept refers to a child's beliefs and knowledge about themselves, including their abilities, roles, and attributes (Seifert, 2011). In middle childhood, children begin to describe themselves not just by physical traits or likes and dislikes, but also by internal characteristics such as competencies ("I'm good at math") and roles within relationships ("I'm a helpful friend"). This shift is attributed to advancements in cognitive skills, such as perspective-taking and social comparison (Harter, 2012).

Self-esteem, on the other hand, is the evaluative aspect of the self—it involves how children perceive themselves and how they assess their own worth (Orth et al., 2018). In middle childhood, children begin to develop **domain-specific self-esteem** (such as academic, athletic, or social competence). According to Susan Harter (1999), self-esteem in middle childhood is influenced by perceived competence in five key domains:

1. **Scholastic competence** – how capable a child feels in academic tasks
2. **Social competence** – how well they think they do in peer relationships
3. **Athletic competence** – how skilled they see themselves in sports and physical activities
4. **Physical appearance** – how they perceive their looks and attractiveness
5. **Behavioral conduct** – how well they believe they behave according to expectations

The importance of each domain varies between children and can differ based on cultural or familial values. For example, a child who places high value on athletic ability but perceives themselves as clumsy may have lower self-esteem than a peer who excels in that area or who values academics more.



Figure 19.2.1.1. A school-age child identifies as being smart. Image by Steven Depolo is licensed CC BY 3.0.

Additionally, children in middle childhood develop an overall **global self-esteem**, which is their general sense of self-worth. This global self-esteem is shaped by their evaluations across different domains and how much importance they place on each one (Harter, 1999).

Social Comparison

As children transition into middle childhood, **social comparison** becomes a significant force in shaping both self-concept and self-esteem. According to Festinger's (1954) **Social Comparison Theory**, individuals evaluate their abilities and attributes by comparing themselves to others. This tendency becomes more pronounced during the school years when children are frequently grouped with peers in academic, athletic, and social settings.

Children often engage in two types of social comparisons:

1. **Upward comparisons**, where they compare themselves to peers who they perceive as better at a task or more successful in a domain.
2. **Downward comparisons**, where they compare themselves to those they perceive as less skilled.

While upward comparisons can sometimes be motivating—encouraging children to improve or try harder—they can also lower self-esteem if the child begins to feel inadequate or inferior, especially if the performance gap seems unbridgeable (Dijkstra et al., 2008). Downward comparisons, on the other hand, may boost self-esteem in the short term but may not support long-term motivation or growth.

For example, a child who consistently receives lower grades than their peers may start to believe they are "bad at school," even if they are making progress. Conversely, a child who excels in art and is recognized for it might develop a strong, positive self-concept in that domain, especially if peers and adults offer praise.

Professionals, families, and caregivers play an important role in helping children navigate social comparisons. Encouraging personal bests, emphasizing individual growth over competition, and celebrating diverse talents can help children build a more balanced self-view. Adults can also model how to interpret comparisons constructively—focusing on effort, persistence, and learning rather than solely on outcomes or peer ranking.

The Impact of Media

Modern children are immersed in media from a young age, and media can play a significant role in shaping both self-concept and self-esteem. Television, internet content, social media, and advertising provide models of what it means to be attractive, successful, or accepted, often reinforcing narrow or stereotypical standards (APA, 2017). One particularly influential set of messages involves the **thin ideal** for girls and the **muscular ideal** for boys.



Figure 19.2.1.2. A girl is standing on a modern scale. Image by Nenad Stojkovic is licensed CC BY 2.0.

These body ideals begin to impact children as early as age six, when cognitive development allows them to engage in **social comparison** and understand abstract societal norms (Harriger et al., 2010). The thin ideal promotes slenderness as a key component of beauty for girls, while the muscular ideal emphasizes strength and athleticism as central to masculinity for boys (Tylka, 2011). Exposure to these ideals, especially through media featuring stylized and unrealistic body types, can lead children to evaluate their appearance against these standards. This may contribute to body dissatisfaction, reduced self-esteem, and the early formation of disordered eating habits or behaviors, particularly in children who feel they do not or cannot match those ideals (Levine & Murnen, 2009).

Parents and educators can play a critical role in helping children develop media literacy by encouraging critical thinking about media messages and celebrating diverse body types, which can buffer the negative effects of idealized imagery (Tiggemann & Slater, 2014).

The Self-Esteem Movement

In the late 20th century, a **self-esteem movement** emerged in schools and parenting literature, promoting the idea that high self-esteem is essential for success and well-being. Programs were created to boost children's self-worth, often through unconditional praise and generalized positive reinforcement. While well-intentioned, critics have argued that this approach may have overlooked the importance of real achievement and effort-based feedback (Baumeister et al., 2003). Research now suggests that the most effective way to build self-esteem is to help children experience genuine success and receive encouragement that is specific, accurate, and focused on effort and improvement, rather than just innate traits.

Adults can support children's healthy self-esteem by helping them set realistic goals, recognizing their progress, and encouraging them to value the diverse strengths and talents of others. Rather than trying to eliminate all frustration or failure, the goal is to help children respond with a growth mindset when challenges arise.

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19.2.2: Gender Identity

Learning Objectives

1. Identify gender-based differences in how children express or suppress identity in response to social expectations.
2. Discuss the importance of affirming environments that support diverse gender expressions.

During middle childhood, children's gender identity becomes more stable and deeply embedded within their broader sense of self. As they grow cognitively and socially, children increasingly internalize societal expectations and peer norms related to gender, and these influences can shape how they express or suppress their interests and identity.

Research has shown that girls and boys navigate gender identity differently during this stage, often in response to varying levels of societal pressure and peer reinforcement.



Figure 19.2.2.1: Social influences such as cultural norms impact children's interests, dress, style of speech, and even life aspirations. Image by Amanda Westmont is licensed under CC BY-NC-SA 2.0.

Gender-Based Differences in Identity Expression

Studies indicate that girls are more likely than boys to report discontent with aspects of their gender identity during middle childhood (Martin & Ruble, 2010). This may be related to societal pressures around physical appearance, behavior, and the early internalization of body ideals, especially as puberty approaches. Girls are also more likely to express a broader range of interests during early and middle childhood, including those traditionally considered masculine, such as sports or science. However, many girls begin to abandon cross-gender interests around ages 9 to 11 in response to increasing pressure to conform to traditional gender roles and peer norms (Halim et al., 2014).



Figure 19.2.2.2. Girls are more likely to express a broader range of interests in middle childhood, but many of their cross-gendered interests are abandoneded due to increasing peer pressure to conform. Image is licensed CC0 1.0.

In contrast, boys tend to experience more rigid social expectations regarding gender conformity. Research consistently shows that boys face stronger sanctions from peers and adults when they display behaviors or interests perceived as feminine (Blakemore et al., 2009). Boys who express cross-gender interests—such as enjoying dance or playing with dolls—are often viewed less favorably by peers and are at increased risk for peer rejection or bullying (Martin, 1990). As a result, many boys suppress interests that deviate from gender norms in order to avoid negative social consequences.



Figure 19.2.2.3. Boys also receive peer pressure to conform and are more likely to be bullied for expressing interest in cross-gendered interests. Image by Jamie McFarlane is licensed CC BY-NC-SA 2.0.

Interestingly, girls who exhibit cross-gender interests are often viewed more positively and may even gain popularity in certain contexts, especially when those interests are associated with assertiveness or athleticism. However, this acceptance tends to be short-lived, as gender norms intensify in late childhood and early adolescence, prompting many girls to shift back toward more traditional expressions of femininity (Halim et al., 2017).

Social Pressures and Identity

These patterns show us that society is more accepting of girls "who act like boys" than of boys who "act like girls". This uneven standard can make it harder for boys to express themselves freely, while girls may lose confidence in exploring their full range of interests. The result is that children's choices become more limited, not because of what they actually like, but because of what others expect from them.

Therefore, in this stage, it is critical for adults to provide affirming environments that allow children to explore their interests without fear of judgment and to let them know it's okay to be different.

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19.2.3: Ethnic and Racial Identity

Learning Objectives

1. Define ethnic and racial identity
2. Describe the typical progression in children's understanding of race and ethnicity from ages 6 to 10.

In middle childhood, children become increasingly aware of race and ethnicity as important aspects of their social identity. **Ethnic and racial identity** refers to how individuals view themselves in relation to racial or cultural groups, including the meanings and values they assign to group membership. This identity begins forming early in life but becomes more coherent and consciously held during the elementary school years.

Children's ability to construct a meaningful ethnic or racial identity is linked to their cognitive development, which allows them to move beyond simple labels and into more complex understandings of group membership, societal messages, and historical context (Umaña-Taylor et al., 2014).

Research suggests a developmental progression in children's understanding of race and ethnicity:

- Around ages 6 to 8, children can label the group to which they belong using terms like Black, White, Hispanic, or Asian. They begin to identify with the customs, language, or traditions of their family and community (Quintana, 1998).
- Between the ages of 7 and 8, children begin to understand that group differences are linked to both biological features (e.g., skin color) and social experiences (e.g., cultural traditions or experiences of discrimination).
- By the ages of 8 to 10, many children begin to grasp the concept of ethnic and racial constancy—the idea that a person's race or ethnicity is stable over time and not easily altered by behavior or appearance (Hughes et al., 2006).



Figure 19.2.3.1. A young girl in traditional native attire. AI-generated image is hosted by StockCake and licensed CC0 1.0.

This emerging understanding can influence how children see themselves, how they interpret others' behavior, and how they respond to messages from family, peers, media, and society at large. Children from racially or ethnically minoritized groups may begin to recognize when they are treated differently and start to develop strategies for coping with or interpreting those experiences.

The positive development of ethnic and racial identity has been associated with higher self-esteem, greater academic achievement, and improved psychological well-being (Rivas-Drake et al., 2014). Adults play a crucial role in this process by fostering cultural pride and engaging in age-appropriate discussions about diversity and fairness.

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19.2.4: Motivation as Self-Efficacy

Learning Objectives

1. Define motivation.
2. Explain the difference between intrinsic and extrinsic motivators.
3. Describe how self-efficacy influences learning and behavior during middle childhood.
4. Explain the concept of learned helplessness.
5. Identify ways adults can support motivation and build children's self-efficacy.
6. Recognize the role of peer comparison and self-assessment in shaping children's beliefs about competence.

Motivation refers to the internal or external forces that initiate, guide, and sustain behavior. In this age group, children begin to demonstrate more consistent patterns of motivation, shaped by their beliefs about their own abilities, the feedback they receive from others, and their past experiences with success or failure.

Extrinsic vs. Intrinsic Motivation

Both **intrinsic** and **extrinsic** motivators can drive children in middle childhood. **Intrinsic motivation** arises from within and reflects a genuine interest or enjoyment in the task itself. For example, a child might read books about animals simply because they find the topic fascinating or draw pictures because it feels fun and rewarding.

Extrinsic motivation, on the other hand, stems from external incentives, such as rewards, grades, or praise. A child might complete their homework to earn a sticker, win a prize, or avoid punishment. While extrinsic rewards can be effective in the short term, over-reliance on them may reduce intrinsic interest over time, especially if the task itself isn't enjoyable (Deci & Ryan, 1985). Research indicates that motivation is strongest when children are given some autonomy and feel competent in their activities (Ryan & Deci, 2000).



Figure 19.2.4.1: A lollipop can be an extrinsic motivator. Image by strausadolf on Pixabay.

Learned Helplessness and Self-Efficacy

A central component of motivation in this stage is **self-efficacy**, which refers to the belief that one can successfully complete a task or achieve a goal (Bandura, 1997). Children with high self-efficacy are more likely to take on challenges, persist through difficulties, and respond positively to setbacks. For example, a child who believes they can improve their math skills with practice is more likely to attempt difficult problems and seek help when needed.

In middle childhood, children are cognitively capable of comparing their abilities to those of their peers and making judgements about their competence in all developmental domains. This increased self-awareness means that self-efficacy beliefs become more differentiated (e.g., feeling confident in reading but not in sports) and more accurate. According to Bandura (1997), the most beneficial level of self-efficacy is one that matches or slightly exceeds a child's actual abilities—enough to foster persistence without setting the child up for repeated failure.



Figure 19.2.4.2: If this girl thinks that studying won't help her do well on the test, her low self-efficacy may develop into learned helplessness. Image by amenclinicsphotos ac is licensed under CC BY-SA 2.0.

Why Self-Efficacy Matters

When self-efficacy is too low, children may begin to feel that effort is pointless—no matter how hard they try, they won't succeed. This mindset can lead to learned helplessness,

a state in which children believe they have no control over outcomes and stop trying to improve. Martin Seligman (1995) first identified this pattern in children who experienced repeated failure or received inconsistent feedback. These children often blame themselves for setbacks, see the situation as unchangeable, and generalize failure across many areas of life.

For instance, after failing a spelling test, a child with learned helplessness might say, "I'm bad at all schoolwork and I'll never do well," while a child with higher self-efficacy might say, "That test was hard, but I didn't study enough. I'll do better next time."

Helping children develop realistic, positive beliefs about their abilities can significantly impact their academic and emotional well-being. Adults can support self-efficacy by:

- Setting achievable goals that match a child's current skill level
- Offering encouragement that emphasizes effort and strategy over innate ability
- Giving children opportunities to experience success through practice and support
- Helping children reflect on progress and problem-solve when things are difficult

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SECTION OVERVIEW

19.3: Emotional Development and Challenges

Learning Objectives

1. Explain how cultural and social contexts influence emotional expression.
2. Differentiate between internalizing and externalizing emotional challenges in children.

In middle childhood, children become increasingly skilled at identifying and managing emotions in ways that align with cultural expectations. They understand when and how it is acceptable to express emotions such as fear, sadness, and anger, and they begin to regulate these emotions more independently (Thompson & Meyer, 2007).

By this age, most children can adjust their emotional responses based on social context—for example, remaining calm in class even when frustrated or showing empathy when a peer is upset. Cultural norms strongly influence how emotions are expressed and interpreted, and children learn to follow these patterns to fit in with peers and meet adult expectations (Saarni, 1999).

While emotional regulation improves during this stage, some children experience difficulties that lead to more persistent emotional challenges. These challenges are often described as **internalizing behaviors** (e.g., anxiety, depression) or **externalizing behaviors** (e.g., aggression, defiance) (Achenbach & Rescorla, 2001). These types of behaviors may result from the kinds of adverse childhood experiences you read about in Chapter 16, Section 8, or there could be other influences impacting the social and emotional development of the school-age child. In the following sections, we will examine common emotional concerns in middle childhood: fear and anxiety, sadness and depression, and anger and aggression.

Topic hierarchy

19.3.1: Fear and Anxiety

19.3.2: Sadness and Depression

19.3.3: Anger and Aggression

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19.3.1: Fear and Anxiety

Learning Objectives

1. Distinguish between fear and anxiety in middle childhood.
2. Explain the characteristics and symptoms of common anxiety disorders in children.

Fear and anxiety are common emotional experiences for children, especially during middle childhood. Although the two are related, they are distinct. Fear is a reaction to a specific, identifiable threat, like a barking dog or a thunderstorm. Anxiety, on the other hand, is more often a response to a vague or future threat, such as worrying about failing a test or not having friends at school (Muris & Field, 2010).



Figure 19.3.1.1. An anxious girl hiding behind a cloth. Image is hosted by PickPik in the public domain.

As children get older, their fears tend to become more realistic. Younger children may fear imaginary creatures or being alone at night, while older children may worry about school performance, social acceptance, or safety in the real world. Research shows that girls are more likely than boys to report fears and anxiety, especially in social or academic settings (Broeren & Muris, 2009).

Although it is normal for children to experience some anxiety, high levels of persistent anxiety can interfere with daily functioning. When this happens, the child may have an anxiety disorder. The exact cause of anxiety disorders is usually unknown, but they likely result from a combination of genetic and environmental factors. Brain imaging studies have shown that in people with anxiety disorders, the **amygdala**—a brain region involved in emotional responses—tends to be hyperactive, which may make them more sensitive to perceived threats (Monk et al., 2008).

Several types of anxiety disorders can appear in middle childhood. These are outlined in the table below.

Table 19.3.1.1. Common types of anxiety disorders in children.

Diagnosis	Description	Common symptoms
Specific phobia	Intense fear of a particular object or situation that lasts at least 6 months	Avoidance, crying, panic, physical complaints
Separation anxiety disorder	Excessive fear of being away from a parent or caregiver to whom the child is attached (more so than what is age-appropriate)	Refusal to go to school, clinginess, nightmares, physical symptoms when apart
Social anxiety disorder	Intense fear of being judged or embarrassed in social situations, particularly by peers	Avoiding peers or group activities, extreme self-consciousness, silence in groups

Children with anxiety disorders often try to avoid situations that make them feel nervous, which can interfere with school, friendships, and daily life. If left untreated, anxiety can continue into adolescence and adulthood. Longitudinal studies show that childhood anxiety disorders often predict later problems, such as depression, substance use, or continued anxiety in adulthood (Copeland et al., 2009). This shows that anxiety in children is not something they simply grow out of, and early support and intervention are important.

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19.3.2: Sadness and Depression

Learning Objectives

1. Explain how sadness is typically experienced and resolved in middle childhood.
2. Identify key signs and symptoms of depression in children.

Sadness is a normal part of emotional life in middle childhood. Children may experience sadness in response to disappointing or stressful events. For most children, sadness is a temporary emotion that resolves as they adapt to challenges and receive support from others.

For some children, however, sadness becomes more persistent and begins to interfere with daily life. When a low mood is long-lasting and disrupts functioning at home, at school, or with peers, it may indicate **depression**. Although depression is often associated with adolescence and adulthood, it can also emerge during middle childhood (American Psychiatric Association, 2013), impacting about 2% of children between the ages of 6 and 11, where boys are just as likely to suffer from depression as girls (Mullen, 2018).

In children, depression may present differently than in older individuals. Rather than expressing sadness openly, children may show irritability, withdrawal from activities, reduced energy, difficulty concentrating, or changes in sleep or appetite. Feelings of low self-worth or guilt may also be present, although children may not always express these emotions verbally.



Figure 19.3.2.1. A sad child looking through a fence. Image hosted by blackwhite is licensed CC0 1.0.

The causes of depression are complex and include biological, genetic, pyschosocial, and environmental influences. Brain imaging studies have found differences in regions such as the amygdala and hippocampus among children with depressive symptoms (Barch et al., 2012). Stressful life experiences and difficulties in emotional regulation also contribute to risk (Weissman et al., 1999).

Research indicates that depression beginning in childhood often persists into later developmental periods. Children who experience depression are at greater risk for recurrence in adolescence and adulthood (Kovacs et al., 2016). Early identification and support are important to promote better long-term outcomes.

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19.3.3: Anger and Aggression

Learning Objectives

1. Distinguish between anger and aggression.
2. Describe characteristics and diagnostic criteria for ODD, DMDD, and Conduct Disorder.
3. Explain the role of family dynamics and intervention strategies in managing behavioral disorders.
4. Discuss the influence of media exposure on aggressive behavior in children

Anger and aggression are common emotional experiences in middle childhood. **Anger** is an internal emotional response to frustration or perceived injustice. Aggression is a behavioral expression of anger, involving actions intended to harm or control others (Tremblay, 2000). Aggression may be physical or verbal/emotional and is activated, in large part, by the amygdala, while being regulated by the prefrontal cortex. While anger is typical and often short-lived, persistent or intense aggression can signal a risk for behavioral disorders.

As children grow, most learn to regulate their anger through strategies such as verbal problem-solving or seeking adult support. Physical aggression, common in early childhood, usually declines during middle childhood, with verbal or relational forms of aggression (such as exclusion or rumor-spreading) becoming more prominent (Underwood, 2003).

However, when aggressive behaviors continue, intensify, or cause significant problems at home, school, or with peers, they may indicate the presence of a behavioral disorder.



Figure 19.3.3.1: This boy is threatening physical aggression. Image by Philippe Put is licensed under CC BY 2.0.

Disorders Related to Anger or Aggression

Oppositional Defiance Disorder (ODD)

Oppositional Defiant Disorder is a condition characterized by a frequent and persistent pattern of angry, irritable mood, argumentative or defiant behavior, and vindictiveness toward authority figures (American Psychiatric Association, 2013). These behaviors extend beyond typical childhood oppositional behavior and persist for at least six months.

Criteria for diagnosing ODD include symptoms such as:

- Frequent temper loss
- Active defiance or refusal to comply with requests
- Deliberately annoying others
- Blaming others for mistakes
- Being spiteful or vindictive at least twice in six months

The behavior must occur more often than is typical for the child's developmental level and cause significant problems in social, educational, or family functioning.

Research has linked ODD to patterns of negative family interactions, often described as a **coercive family process**. In these families, the behaviors of parents and children mutually negatively reinforce each other. For example, a child may refuse to comply with a request, and the parent may escalate threats or give in, teaching the child that oppositional behavior is effective (Patterson, 2002).



Figure 19.3.3.2. A school-age girl seems to be tuning her parents out while mom is talking and dad looks disconnected. Image by Tima Miroshnichenko is licensed by Pexels.

Intervention programs for ODD often focus on improving parenting practices. Effective programs include parent management training, which teaches consistent discipline, positive reinforcement, and communication skills. Cognitive-behavioral therapy for children can also help develop anger management and problem-solving skills (Eyberg et al., 2008).

Disruptive Mood Dysregulation Disorder (DMDD)

Disruptive Mood Dysregulation Disorder is a newer diagnosis introduced to address children with severe and chronic irritability and frequent temper outbursts. Unlike ODD, DMDD emphasizes persistent negative mood between outbursts, not just oppositional behavior (American Psychiatric Association, 2013).

Children with DMDD display:

- Severe temper outbursts three or more times a week
- Irritable or angry mood every day
- Symptoms present for at least one year, in multiple settings

DMDD is considered when mood disruption is pervasive and ongoing, not just situational or reactive to specific events.

Conduct Disorder (CD)

When aggression becomes more severe, including behaviors that violate the rights of others or major social rules, it may be diagnosed as Conduct Disorder. Children with CD may engage in bullying, physical fights, theft, destruction of property, and serious rule violations like truancy or running away.

Conduct Disorder represents a more serious level of behavioral disturbance. It is associated with a higher risk of later criminal behavior, substance use problems, and mental health issues in adolescence and adulthood (Frick & Viding, 2009).

Multisystemic Treatment

For children and adolescents with serious conduct problems, intensive approaches like **Multisystemic Treatment** have been developed. MST is a family- and community-based intervention targeting the various systems influencing the child, including family, school, and peers (Henggeler et al., 2009)- such as empowering caregivers to improve parenting skills, promoting school engagement, strengthening family relationships as a whole, and removing the child from deviant peer groups. MST has been shown to reduce rates of out-of-home placements and criminal behavior in youth with severe conduct problems.

Media Exposure



Figure 19.3.3.3. First-person shooter games are one type of high-violence video game. A study published in the *Journal of Youth and Adolescence* found that approximately 18.1% of preadolescents reported playing high-violence video games, with 12.9% engaging in such games for two or more hours per day (Tortolero et.al, 2014). Image by Hahnchen is licensed CC BY-SA 3.0.

Media exposure has also been linked to aggressive behavior in children. Research shows that frequent viewing of violent television, movies, video games, and online content is associated with higher levels of aggression (Anderson et al., 2017). Children who are repeatedly exposed to media violence may become desensitized to aggression, view it as an acceptable way to solve problems, or imitate aggressive behaviors they observe. While the media is not the sole cause of aggression, it is recognized as an important contributing factor.

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- **12.8: Aggression, Antisocial Behavior, Bullies, and Victims** by Paris, Ricardo, Rymond, & Johnson is licensed CC BY 4.0. Original source: https://open.umn.edu/opentextbooks/textbooks/child-growth-and-development.

SECTION OVERVIEW

19.4: Family Relationships

Learning Objectives

1. Explain how families function as interdependent systems.
2. Describe the evolving nature of the parent-child relationship during middle childhood.
3. Identify indicators that a child may be ready for increased independence.
4. Compare how cultural values influence parenting practices in middle childhood.

The Family as a System

Families operate as systems, meaning that relationships between individual members are interconnected. A change in one relationship, such as increased conflict between parent and child, can affect the functioning of the entire family (Cox & Paley, 1997). In middle childhood, as children become more independent, families often adjust their patterns of communication, emotional support, and overall child-rearing (guidance) techniques. Maintaining a balance between providing structure and allowing autonomy becomes an important task for families during this period.

Healthy family systems tend to have open communication and consistent expectations. Disruptions within the family, such as divorce, economic stress, or parental conflict, can influence children's adjustment and are associated with higher risks of behavioral and emotional problems (Davies & Cummings, 1994).



Figure 19.4.1. The family system is completely interdependent on each of the individual relationships between family members.
Image by a4gpa is licensed CC BY-SA 2.0

The Parent-Child Relationship

The parent-child relationship shifts noticeably during middle childhood as children seek and are granted greater degrees of independence. Parents transition from direct, daily management of activities to a more supervisory and supportive role. Children are increasingly expected to manage tasks such as homework, household responsibilities, and aspects of their social lives, while still relying on parents for emotional security, guidance, and the setting of appropriate boundaries.

This shift is particularly relevant for families in which both parents work. Many school-age children spend part of their afternoons unsupervised, either at home or in after-school programs. After-school programs can provide important structure and supervision, in addition to enrichment activities, helping children stay engaged and supported during times when adult supervision is not available at home. High-quality after-school care has been linked to positive academic and social outcomes, particularly for children at higher risk of behavioral problems (Vandell et al., 2005).



Figure 19.4.2. Cal State offers before and after-school care as part of its on-campus lab school program, which is nationally accredited. Image by Heather Carter is licensed CC BY-SA 4.0.

Supervision remains important during middle childhood, but the degree and form of supervision must be responsive to children's individual maturity levels and developmental needs. Children who demonstrate responsibility in managing tasks and solving problems should be granted more autonomy, while those who struggle may require closer monitoring. Effective parenting during this stage involves gradually adjusting the balance between supervision and independence. As children approach adolescence, parents must regularly reassess and renegotiate limits and responsibilities to support their growing autonomy while maintaining necessary oversight.

Studies show that children who experience appropriate levels of supervision, paired with emotional support, are less likely to engage in delinquent behaviors and tend to demonstrate better academic and social outcomes (Dishion & McMahon, 1998). In contrast, overly controlling or excessively permissive parenting approaches can undermine children's confidence, encourage secrecy, or contribute to behavioral issues.

Signs a Child is Ready for Greater Independence

Granting greater independence during middle childhood should be based on a child's demonstrated skills and behavior, rather than just their age. Parents and caregivers can look for the following signs to help determine when a child may be ready for additional responsibility:

- Consistently follows rules and completes assigned tasks without frequent reminders.
- Demonstrates good judgment when solving small problems independently.
- Communicates openly about their activities, plans, and whereabouts.
- Shows the ability to manage basic routines, such as homework, chores, and self-care.
- Respects established boundaries and responds appropriately to limits.
- Manages frustration and disappointment without aggressive outbursts.

Independence should be granted gradually and monitored closely. As children show maturity in one area, additional responsibilities can be added. Parents should remain flexible, adjusting levels of supervision as needed based on the child's behavior and developmental progress.

Cultural Contexts

Parenting practices are closely tied to cultural beliefs about what is considered appropriate behavior and successful development at this stage. In many Western cultures, including much of the United States, there is an emphasis on fostering autonomy, self-expression, and independence during middle childhood. Parents often encourage children to make decisions, express opinions, and manage personal responsibilities, preparing them for the increased independence of adolescence.

In contrast, parenting practices in other cultural groups may prioritize interdependence, respect for authority, and family obligations. For example, Latino families often emphasize *familismo*, the importance of strong family loyalty, closeness, and respect for elders. Middle childhood in Latino families may involve encouraging children to contribute more to family life, such as helping with younger siblings or participating in family activities, while still maintaining parental authority (Calzada et al., 2010).



Figure 19.4.3. Hispanic families value closeness and participation in family activities. Image by Joseph Thibault is licensed CC BY-SA 2.0.

Asian American families, influenced by Confucian values, may stress academic achievement, respect for authority, and emotional restraint during middle childhood. Parents may adopt a more directive style, expecting children to meet high academic and behavioral standards while reinforcing obedience and family harmony (Kim et al., 2014).

Although parenting styles differ across cultures, research suggests that children's adjustment is most positive when parenting practices align with cultural values and when parents provide emotional support alongside appropriate expectations. What may appear as "strict" parenting from one cultural perspective may actually promote security and achievement within another cultural framework (Chao, 1994).

Understanding these cultural differences is important for recognizing the diversity of family experiences in middle childhood and avoiding misinterpretations of parenting behaviors that are rooted in cultural norms.

Topic hierarchy

19.4.1: Siblings and Only-Children

19.4.2: Diverse Families

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19.4.1: Siblings and Only-Children

Learning Objectives

1. Describe the roles siblings play in middle childhood development.
2. Differentiate between shared and nonshared environmental influences within families.
3. Summarize how birth order may affect children's behavior and family roles.
4. Explain the impact of differential parental treatment on sibling relationships and self-esteem.
5. Identify common developmental characteristics of only children.

Siblings play an important role in middle childhood development. For many children, siblings are companions, rivals, teachers, and sources of emotional support. However, the experience of having siblings can vary widely, and not all sibling relationships are positive.

Siblings often play an essential role in middle childhood development. For many children, siblings are companions, rivals, teachers, and sources of emotional support. However, the experience of having siblings can vary widely, and not all sibling relationships are positive or supportive.

Siblings and the Environment

The family environment is commonly described in terms of shared and nonshared experiences. **Shared environments** include experiences that siblings living in the same household typically have in common, such as parental values, socioeconomic status, or neighborhood conditions. **Nonshared environments** involve unique experiences that differentiate siblings, such as distinct friendships, separate teachers, or variations in how parents interact with each child (Plomin & Daniels, 1987).

Research suggests that nonshared environmental factors account for a significant portion of the variability in children's development, even among siblings. While siblings may share the same home environment, their individual experiences within the family often differ in meaningful ways.



Figure 19.4.1.1. A younger sister holding on to her older brother's arm. Image is in the public domain.

Birth Order

Birth order is one factor contributing to nonshared environmental influences. Studies suggest that firstborn children may be more likely to assume leadership roles, exhibit higher achievement motivation, and align more closely with parental expectations (Sulloway, 1996). Later-born children are sometimes described as more socially outgoing, rebellious, or adaptable, which may reflect their different roles within the family system.

Although these trends have been widely discussed, the effects of birth order are generally modest. They can be influenced by other factors such as family size, cultural expectations, and individual temperament.

Differential Parental Treatment

Parents may treat siblings differently based on characteristics such as age, gender, temperament, or interests. This **differential parental treatment** can impact children's self-esteem, sibling relationships, and perceptions of fairness within the family (Feinberg & Hetherington, 2000).

Children who perceive themselves as less favored by their parents may experience more conflict with their parents and siblings, which can impact their emotional and behavioral adjustment. However, when differences in treatment are deemed appropriate for

the situation, such as granting age-appropriate privileges, the negative effects may be mitigated.

Only Children

Children raised without siblings, often referred to as **only children**, also have distinctive developmental experiences. Only children often interact more with adults and may receive greater individualized attention. They may have fewer daily opportunities for sibling-like conflict and collaboration at home.

Research has challenged the stereotype that only children are spoiled or socially disadvantaged. Studies indicate that only children typically perform as well as, or better than, peers with siblings on measures of academic achievement, social adjustment, and self-esteem (Falbo & Polit, 1986). They often develop closer relationships with their parents, although they may experience greater pressure to meet high parental expectations.

Whether growing up with siblings or as an only child, the quality of family relationships and the broader social environment play critical roles in shaping children's emotional and social development.

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19.4.2: Diverse Families

Learning Objectives

1. Identify common family structures experienced by children.
2. Describe experiences and outcomes for children in diverse family structures.
3. Describe how family relationship quality affects children's adjustment more than family structure.
4. Explain common custody arrangements and how children adjust to divorce.

Family structures have become increasingly diverse, and children may grow up in a variety of family forms. Although different family structures present different experiences, research consistently shows that the quality of family relationships has a more substantial impact on children’s adjustment than the specific type of family arrangement.

Single-Parent Families

Single-parent families, most often headed by mothers, are a common family form in the United States. In 2022, 39.8% of all births were to unmarried women, many of whom were cohabiting with a partner (Centers for Disease Control and Prevention, 2024). Single parenthood can arise for several reasons, including having a child outside of marriage, divorce, or the death of a parent. Each pathway to single parenthood presents distinct challenges and support systems for children.

Children raised in single-parent households may face greater economic challenges, as single-parent families are more likely to experience lower household incomes compared to two-parent families. Single parents may also experience higher levels of stress due to the demands of balancing work, childcare, and household management.



Figure 19.4.2.1. Single parenthood can occur for various reasons, but all single-parent households face their own unique set of challenges. Image is in the public domain.

On average, children in single-parent families are at greater risk for academic difficulties and behavioral problems compared to children in two-parent families (Amato, 2005). However, most children in single-parent homes adjust well, especially when they have strong, supportive relationships with the custodial parent and access to extended family, after-school programs, or community support services. The presence of a consistent, emotionally available parent remains a critical protective factor.

Co-Parenting and Cohabitation

Co-parenting refers to the ways in which two or more adults share the duties of raising a child, regardless of whether they live together. Co-parenting can occur within intact families, following divorce, or in other family arrangements such as joint custody or extended family households.

Effective co-parenting is characterized by quality communication regarding the child's care and shared decision-making. Positive co-parenting relationships are associated with better outcomes for children. In contrast, high-conflict or inconsistent co-parenting can undermine children’s sense of security and contribute to adjustment difficulties.

Cohabitation, where unmarried partners live together, has become more prevalent. As of 2023, approximately 9.1% of U.S. adults were cohabiting, up from 3.7% in 1996. Among adults aged 18 to 44, 59% have cohabited at some point, surpassing the 50% who have ever been married. While cohabitation can provide a stable environment for children, the outcomes often depend on the quality and stability of the parental relationship.

Divorce and Custody Arrangements

Divorce is a significant life change for many families and can have important effects on children. In the United States, the divorce rate was approximately 2.5 divorces per 1,000 people in 2022 (Centers for Disease Control and Prevention, 2024). It is estimated that around 40% of children will experience the divorce of their parents before reaching adulthood (Amato, 2010).

The experience of divorce can be disruptive, bringing changes in living arrangements, financial stability, family routines, and emotional security. Children may initially experience trauma related to loss, confusion, or fear about the future. Feelings of sadness, anger, loyalty conflicts, and anxiety are common. However, many children also demonstrate adaptation over time as they adjust to new family dynamics.



Figure 19.4.2.2. Divorce can lead to both trauma and adaptation for children. Image is licensed CC BY-NC 4.0.

Custody arrangements after divorce can vary:

1. **Sole custody** places the child primarily with one parent while the other typically has visitation rights.
2. **Joint custody** allows both parents to share decision-making (legal custody) or share physical time with the child (physical custody).
3. **Birdnesting** is a less common arrangement in which the child remains in the family home while the parents rotate living there.

Children tend to adjust more successfully to divorce when certain protective factors are present. Research consistently shows that low parental conflict, supportive relationships with both parents, and stability in routines and schooling are key predictors of better outcomes (Kelly & Emery, 2003).

- Reassuring children that they are loved and not responsible for the separation.
- Maintaining consistent routines and providing emotional security.
- Encouraging healthy relationships with both parents whenever possible.
- Communicating clearly and calmly about changes, while being honest in an age-appropriate way.
- Seeking outside counseling support when children show signs of ongoing distress.



Figure 19.4.2.2. Maintaining a quality relationship with both parents helps children cope with divorce and the associated changes in their family life. Image by Ron Lach is licensed by Pexels.

Stepfamilies and Blended Families

Stepfamilies and blended families are formed when a parent remarries or partners with someone who is not the child's biological parent. These families often undergo a period of adjustment as they negotiate family roles and relationships.

Children in stepfamilies may face challenges related to shifts in family dynamics and perceived loyalties. Research shows that children who feel close to their stepparent and experience consistent, supportive parenting are more likely to adjust well over time.

Adjustment can vary by age, with younger children often adapting more easily to blended family structures than adolescents, who may resist changes to family roles and routines.

Gay and Lesbian Parents

Same-sex parent families are an increasingly visible part of the family landscape. As of 2019, approximately 114,000 same-sex couples were raising children in the United States. Among these, about 24% of female same-sex couples and 8% of male same-sex couples were parenting children under 18 years old. Same-sex couples grow their families through various pathways, including adoption, foster care, assisted reproductive technologies (ART), and surrogacy. Notably, same-sex couples are four times more likely than opposite-sex couples to have adopted or stepchildren; in 2019, 43.3% of children of same-sex couples were adopted or stepchildren.

Extensive research indicates that children raised by same-sex parents fare as well as those raised by heterosexual parents across various measures of health and well-being. Studies have found no significant differences in mental health, social adjustment, or academic performance between children of same-sex and heterosexual parents. Major professional organizations, including the American Academy of Pediatrics and the American Psychological Association, have affirmed that parental sexual orientation does not negatively impact child development.



Figure 19.4.2.4. Children who grow up with gay parents are likely to be as happy and well-adjusted as children of heterosexual parents. It is the quality of the parent-child relationship rather than the parents' sexual orientation that is most important to a child's development. Image by RDNE Stock Project is licensed by Pexels.

Concerns that children of same-sex parents may experience confusion about gender roles or identity are not supported by empirical evidence. Research indicates that these children conform to gender-typical behaviors and interests at similar rates as their peers with heterosexual parents. A study published in the *New England Journal of Medicine* found no differences in gender identity development between children raised by lesbian mothers and those raised by heterosexual parents (Gartrell et.al, 2018).

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SECTION OVERVIEW

19.5: Peer Relationships

Learning Objectives

1. Describe the role of peer relationships in middle childhood.



Figure 19.5.1. Friendships become increasingly more important in middle childhood, with positive peer relationships supporting healthy social and emotional development in this life stage. Image by Rendan Catipay licensed by Pexels.

Peer relationships become increasingly important during middle childhood. As children spend more time in school and extracurricular activities, interactions with peers become a central part of their social and emotional development. Friendships, group belonging, and peer approval begin to shape children's self-concept and influence their behaviors (Rubin et al., 2006).

During this stage, children develop more advanced social-cognitive abilities that aid in navigating social groups (Bukowski et al., 2010), such as perspective-taking and emotional regulation. These skills help children form and maintain reciprocal friendships, as well as resolve conflicts more independently.

Positive peer relationships can support healthy development by providing emotional security and reinforcing prosocial behavior. At the same time, middle childhood can bring challenges related to peer rejection and exclusion. Children who are socially marginalized or bullied may experience declines in academic performance, increased internalizing symptoms, and reduced self-esteem (Prinstein & Giletta, 2016).

The following sections will explore the development and function of friendships in middle childhood, the dynamics of social status and peer acceptance, and the effects of bullying and peer aggression on child well-being.

Topic hierarchy

19.5.1: Friendships

19.5.2: Social Status

19.5.3: Bullying

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19.5.1: Friendships

Learning Objectives

1. Describe how the meaning and function of friendship changes during middle childhood.
2. Differentiate between Bigelow and La Gaipa's three-stage model and Selman's five-stage model of friendship development.
3. Explain how cognitive and social development influences children's understanding of friendship.

Friendships take on new importance as judges of one's worth, competence, and attractiveness. Friendships offer the opportunity to learn social skills, such as how to communicate effectively with others and how to resolve differences. Children acquire ideas from one another about how to perform certain tasks, gain popularity, choose what to wear, say, and listen to, and how to behave. 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 19.5.1.1: Peers influence a child's self-esteem. Image by Robins Air Force Base is in the public domain.

Stages of Children's Friendship Concepts

Early concepts of friendship based on convenience or shared activities give way to more complex notions involving trust and mutual commitment. These changes are believed to be linked to advances in cognitive development, such as perspective-taking and moral reasoning (Bigelow, 1977; Selman, 1980).

Bigelow and La Gaipa

Bigelow and La Gaipa (1975) outlined three stages of friendship based on children's written descriptions of what they value in friends across different age groups.[45]

Table 19.5.1.1: Three Stages to Children's Conceptualization of Friendship[1]

Stage		Name	Descriptions
Stage One	**Name**	**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	**Name**	**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	**Name**	**Empathy and Understanding**	**Friends are people who are loyal, committed to the relationship, and share intimate information**. Clark and Bittle (1992) reported that eighth graders emphasized this more to a friend. They also found that as early as fifth grade, girls began to view the sharing of secrets and not betraying confidences as crucial to being a friend.

Selman

Selman (1980) took a more structured, Piagetian approach, outlining five stages of friendship development through children's perspective-taking abilities from early childhood to adulthood.

Table **19.5.1.2**: Five Stages of Friendship from Childhood to Adulthood 48

Stage	Name	Descriptions
Stage One	Momentary Physical Interaction	**A friend is someone with whom you are currently playing.** Selman notes that this is typical of children between the ages of three and six years old. These early friendships are based more on circumstances (e.g., a neighbor) than on genuine similarities.
Stage Two	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 with you. 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 someone to be with. Children as young as five and as old as nine may be in this stage.
Stage Three	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.
Stage Four	Intimate and mutual sharing	Typically, between the ages of eight and fifteen, **a friend is someone with whom you can share 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.
Stage Five	Autonomous interdependence	**A friend is someone who accepts you and whom you accept as they are**. At this stage, children, teens, and adults begin to accept and appreciate the differences between themselves and their friends. They are also not as possessive, so they are less likely to feel threatened if their friends have

Stage	Name	Descriptions
		other relationships or interests. Children are typically twelve or older in this stage.

Social Skills and Emotional Benefits

Friendships are very important for children. Social interaction with another child who is similar in age, skills, and knowledge fosters the development of many valuable social skills that will benefit the individual throughout their 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, in addition to those provided by their parents.[47]

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19.5.2: Social Status

Learning Objectives

1. Distinguish between peer groups and individual friendships.
2. Identify the five sociometric peer status categories and their typical characteristics.
3. Explain how peer acceptance or rejection influences social and emotional development.
4. Define rejection sensitivity.
5. List common domains of social comparison in middle childhood.

Peer Groups

As children enter middle childhood, they become more aware of their standing among peers and the broader structure of peer groups. While friendships are characterized by mutual choice and closeness, **peer groups** reflect a more general social dynamic based on reputation, group norms, and social positioning. These groupings play a key role in shaping children's daily experiences at school and influence self-concept, as well as behavior.



Figure 19.5.2.1: Social comparison with peers is an important means by which children evaluate their value. Image by the U.S Army is in the public domain.[50]

Sociometry

One way researchers assess children's standing within peer groups is through **sociometric techniques**, in which children are asked to nominate peers they "like most" and "like least" within their classroom. This method helps identify patterns of **peer acceptance** and **rejection**, and allows researchers to classify children into social status categories (Rubin et al., 2011).

		Number of "least liked" nominations		
		Many		Few
Number of "most liked" nominations	Many	Controversial		Popular
			Average	
	Few	Rejected		Neglected

Figure 19.5.2.2. Sociometric peer statuses. Image in Jakobsen & Fischer (2023) is licensed CC BY-NC-SA 4.0

- **Popular children** receive many positive nominations and few negative ones. They tend to be cooperative, friendly, and socially skilled.
- **Rejected children** receive many negative nominations and few positive ones. This group may include children who are aggressive, disruptive, or socially withdrawn.
- **Neglected children** are rarely mentioned, either positively or negatively, and may be shy, quiet, or simply overlooked.
- **Controversial children** receive a mix of positive and negative nominations. They may be socially active but also aggressive or dominant.
- **Average children** receive a moderate number of both positive and negative nominations.

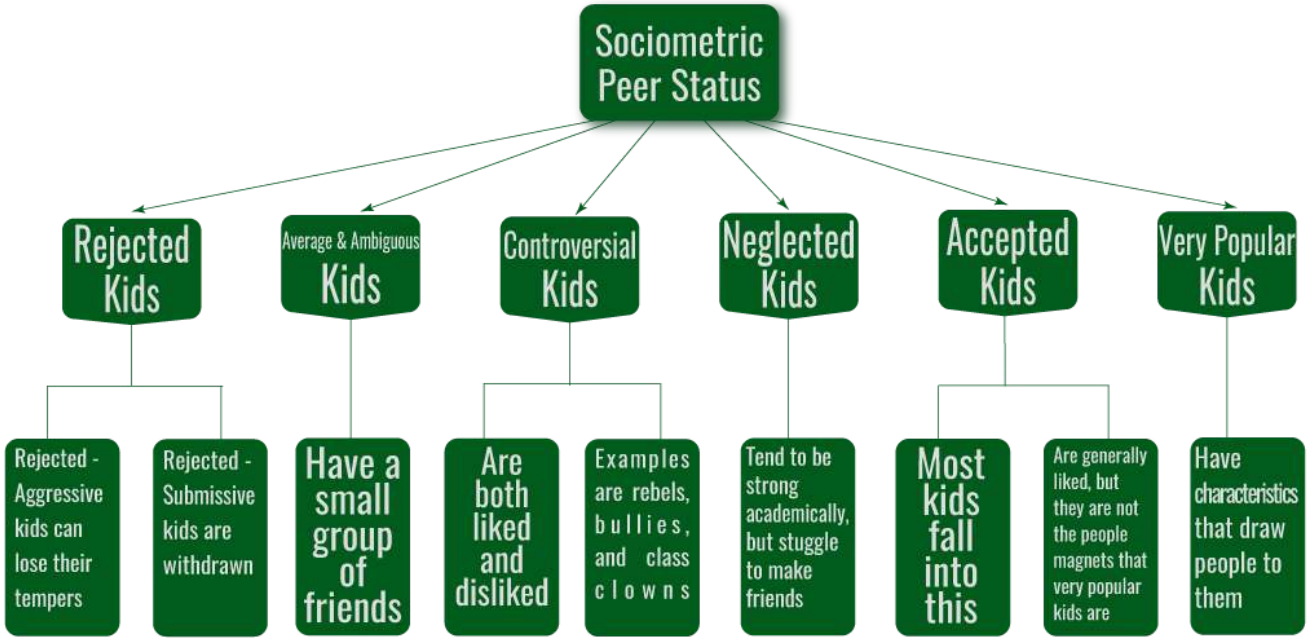


Figure 19.5.2.3. Sociometric peer status. Image by Florida State College at Jacksonville is licensed CC BY 4.0.

Research indicates that **popularity** in middle childhood is often linked to social competence, leadership skills, and emotional regulation (Coie, Dodge, & Coppotelli, 1982). These children tend to have more stable friendships and are more likely to be viewed favorably by both peers and teachers.

In contrast, **peer rejection** is linked to negative outcomes such as loneliness, academic difficulties, and increased risk for externalizing or internalizing problems. Children who are chronically rejected—especially due to aggressive or disruptive behavior—may begin to form friendships with similarly rejected peers, reinforcing antisocial patterns (Ladd, 2005).

One emerging area of focus is **rejection sensitivity**—a tendency to anxiously expect, readily perceive, and overreact to rejection in social situations. Children with high rejection sensitivity may interpret neutral peer interactions as negative and respond with withdrawal or hostility. This can create a cycle where expectations of rejection contribute to further exclusion (Downey & Feldman, 1996). Over time, these patterns can damage children's self-esteem and increase the likelihood of internalizing symptoms such as anxiety or depression.

Social Comparison

Peer group dynamics also contribute to **social comparison**. As children become increasingly attuned to peer evaluations, they begin to assess their abilities and characteristics in relation to those of others. There are five areas in which this tends to occur in middle childhood:

1. Academic competence
2. Athletic abilities
3. Physical appearance
4. Social competence
5. Behavioral conduct

This can lead to motivation and self-improvement, but may also result in anxiety or avoidance when children feel they do not measure up. For example, a child who feels academically inferior to their classmates may withdraw from participation, while another who is admired for athletic ability may develop confidence in leadership roles.

Although these social patterns are still forming, they lay the foundation for later group dynamics in adolescence. Understanding peer group hierarchies and children's place within them is essential for supporting healthy social-emotional growth during this stage.

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19.5.3: Bullying

Learning Objectives

1. Define bullying.
2. Identify distinguishing characteristics that differentiate bullying from forms of conflict.
3. Describe the main types of bullying.
4. Explain the roles involved in bullying situations.
5. Identify risk factors associated with being bullied and with engaging in bullying behavior.
6. Recognize short and long-term effects of bullying on children who bully, who are bullied, and who witness bullying.
7. Identify strategies for preventing and responding to bullying.

Bullying is unwanted, aggressive behavior among school-aged children that happens repeatedly and involves a power imbalance (Olweus, 2010). Kids who bully use their power—such as physical strength, access to embarrassing information, popularity, age, or socioeconomic status—to control or harm others (Chaux & Castellanos, 2014). Bullying occurs throughout middle childhood, peaking in early adolescence, and then declining throughout late adolescence (Pepler et al., 2006). Bullying can happen anywhere, in any environment, but for adolescents, the majority of bullying occurs in schools (Fekkes et al., 2005). Both kids who are bullied and who bully others may have serious, lasting problems both in childhood and adulthood; this includes an increased risk for psychiatric disorders like depression and anxiety, substance abuse, and domestic violence (Copeland et al., 2013).

Types of Bullying

There are three primary types of bullying, and it is not unusual for someone who bullies to utilize more than one type (Fekkes et al., 2005; Rezapour et al., 2019). **Verbal bullying** is saying or writing mean things about another person, including name-calling, inappropriate sexual comments, taunting, and threatening to cause harm. **Social bullying,** sometimes referred to as relational bullying, occurs when a person attempts to harm another person's reputation and relationships. It can be done by purposely excluding someone or getting others to exclude them, spreading rumors, or embarrassing them in public. **Physical bullying** is hurting a person's body or possessions by hitting, kicking, spitting, or breaking their belongings.

Cyberbullying

Cyberbullying is bullying that takes place over digital devices, such as cell phones and computers, and spaces like social media or text (John et al., 2018). Cyberbullying includes sending, posting, or sharing negative, false, or personal information about someone else (John et al., 2018; Wolak et al., 2007). Online gaming and social media are popular environments for cyberbullying to take place (Richard et al., 2021). Given the digital nature of cyberbullying, content shared by individuals can often be viewed by strangers as well as acquaintances, so the bullying may have a much larger audience (Peebles, 2014).



Figure 19.5.3.1. Cyberbullying takes place over digital devices because kids feel anonymous in online spaces. Image by Tim Goww is licensed by Unsplash.

Kids who cyberbully often do so because they feel anonymous in online spaces and that they will not be held accountable for their actions (Barlett et al., 2016; Peebles, 2014). However, the content an individual shares and interacts with online creates a digital footprint of their views, activities, and behaviors (Surmelioglu & Seferoglu, 2019). This digital footprint, or online reputation, may be accessible to employers, colleges, clubs, and others who may be researching an individual in the future. Cyberbullying can harm the online reputation of everyone involved: the person bullying, the person being bullied, and passive witnesses who interact with the content (Subasi et al., 2023).

Cyberbullying has unique concerns that differ from other forms of bullying. Digital devices offer immediate and continuous communication, so it can be difficult for children experiencing persistent cyberbullying to find relief (John et al, 2018; Peebles, 2014; Wolak et al., 2007). Because cyberbullying happens online, teachers and parents may not see it taking place, so it can be harder to recognize (Peebles, 2014).

The Roles in Bullying

Kids often play more than one role in bullying over time: they can bully others, they can be bullied, or they may witness bullying as a bystander. The "Bullying Circle" is a model used to define those directly and indirectly involved in bullying (Olweus & Limber, 2010). All kids need to be taught bullying prevention strategies since bystanders can influence bullying outcomes just as much as those directly involved.

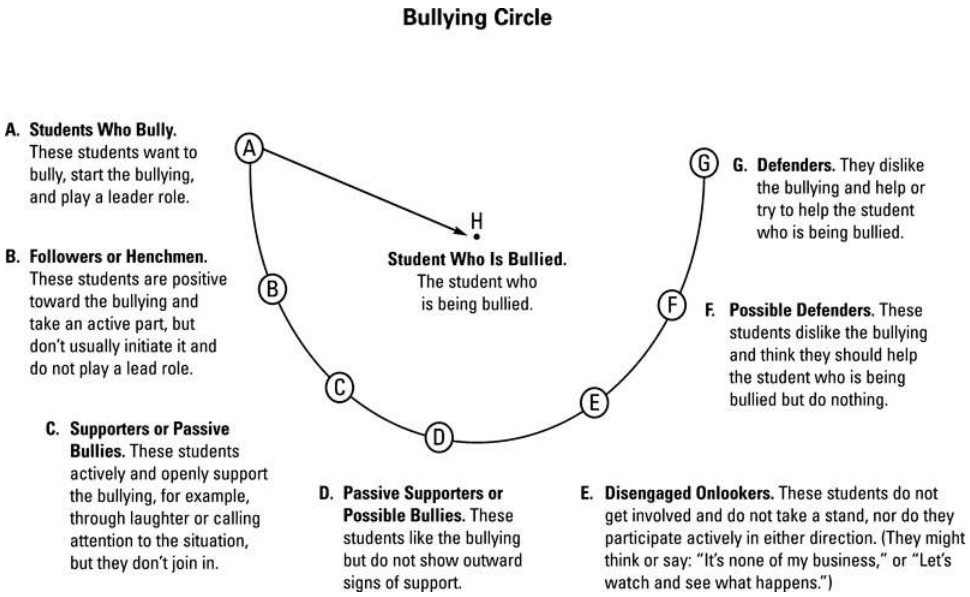


Figure 19.5.3.2. Bullying cirlce (Olweus & Limber, 2010).

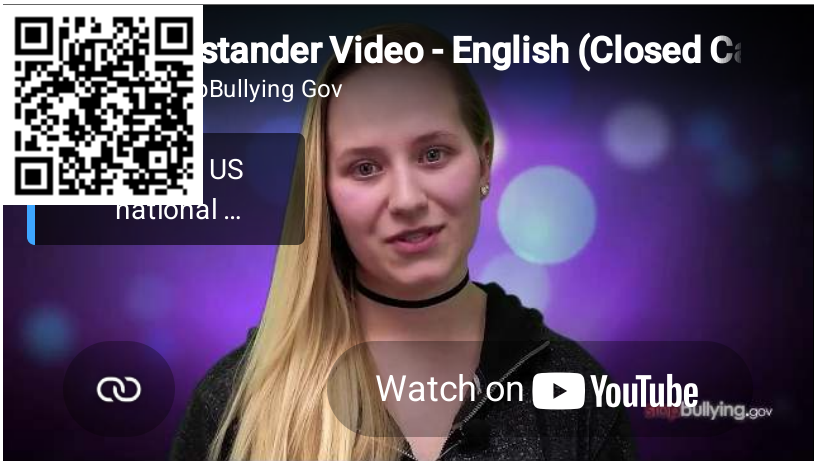
Direct Roles

It is important not to label children as "bullies" or "victims" (PACER, 2018). A label can make a child or adult feel that those involved in the situation possess a trait that cannot be changed. Instead, use person-first language when talking about those involved in the bullying process.

One direct role is **those who bully**, or the adolescents who engage in bullying behavior towards their peers. They are the leader of the bullying in a specific situation. The second direct role is **those who are bullied**, or the adolescents who are the targets of bullying behavior.

Indirect Roles

Indirect roles of bullying are rooted in witnessing the behavior, also known as being a bystander (Olweus & Limber, 2010). **Followers** are individuals who may not have started the bullying, but act as an assistant to those who are bullying. **Supporters** provide an audience for bullying behavior, laughing, or giving other verbal support to those who are bullying. **Onlookers** are individuals who remain separate from the bullying situation and neither reinforce the bullying behavior nor defend the person being bullied; they may want to help, but do not know how to do so. **Defenders** are bystanders who may try to stop the bullying or comfort the person being bullied.



Video 19.5.3.1. *Bystanders* discuss the roles they play in bullying incidents and how they can be key to preventing and stopping bullying. Link: https://youtu.be/StPGbbBBrI0

Who is At Risk?

Risk factors increase the probability that bullying may occur, but they do not guarantee that it will (Ttofi & Farrington, 2010). No single factor puts a child at risk, and factors often compound to increase the overall likelihood that bullying may happen.

Those at Risk of Being Bullied

Generally, those who are bullied have one or more risk factors. Adolescents who are perceived as different from their peers are more likely to be bullied (National Institute, 2017). This can be a physical trait, such as wearing glasses or being overweight, or a social identity like being LGBTQ+ or a certain race (StopBullying.gov, 2023a; Tippett & Wolke, 2014). Adolescents who are perceived as weak, unable to defend themselves, or socially isolated have an increased risk of being bullied (Ttofi & Farrington, 2010). Family dysfunction, depression, low self-esteem, and anxiety are common characteristics of children who are bullied (Ttofi & Farrington, 2010).

Those at Risk of Bullying Others

Children who are well-off socially and those who are socially isolated are both likely to bully others (StopBullying.gov, 2021a). Popular children may bully to assert dominance and maintain their social status, while isolated children may feel a need to lash out at others due to a lack of empathy and social skills (Underwood & Ehrenreich, 2014).

There are specific risk factors that increase the likelihood of someone bullying others. Personality traits like impulsiveness, aggression, and low empathy are linked to bullying in adolescents (Farrington & Baldry, 2010). Individuals who harbor negative perceptions of others and have friends who bully are at a higher risk of experiencing bullying (Ttofi & Farrington, 2010). Kids who have less parental involvement, have issues at home, or witness physical abuse between their parents are more likely to bully (Babarro et al., 2020; Laeheem et al., 2009; Ttofi & Farrington, 2010). Additionally, if children consume more violent media, they may want to model the aggressive behaviors they see (Laeheem et al., 2009).

Warning Signs of Bullying



Figure 19.5.3.3. Children who are bullied are likely to exhibit changes in their health and behavior. Image by Nist6ss is licensed CC BY-SA 2.0.

Recognizing the warning signs is an essential first step in taking action against bullying, as some children may not ask for help. However, be aware that not all children exhibit warning signs, or that the warning signs could indicate other serious issues, like depression or substance abuse, instead of bullying (Victorian Government, 2024).

Children who are being bullied are likely to exhibit changes in their health and behavior (Victorian Government, 2024). Those being bullied may have unexplainable injuries, frequent headaches, and stomach aches. They may feel sick more often or feign illness to avoid going to school. Their eating habits might change, like suddenly skipping meals, binge eating, or feeling hungry after school. They may also have difficulty sleeping or frequent nightmares. Be cautious if their possessions are suddenly lost or damaged, such as clothing, books, electronics, and jewelry.

Kids who bully may demonstrate increasing levels of aggressive behavior (StopBullying.gov, 2021b). This could manifest as fighting and acting out, where the child is frequently sent to the principal's office or detention. They may also have unexplained extra money, new belongings, or injuries.

Many of the warning signs of cyberbullying are linked to a child's use of their device (KidsHealth, 2022). This could include noticeable increases or decreases in device use, unusual emotional responses (such as laughter, anger, or crying) to what is happening on their device, and turning the device off when others are nearby. If they are being cyberbullied, teens might avoid discussions about what they are doing online, withdraw from social situations, and become depressed.

Why Kids Might Not Ask for Help

About 1 in 3 children who are bullied do not report the behavior to someone, and they are more likely to tell a friend or sibling than they are an adult (Luxenberg et al., 2019). Kids do not tell adults for many reasons, including: feeling helpless, fearing punishment from their bully or the adult, embarrassment, appearing weak, and feeling alone (Committee for Children, 2016; DeLara, 2012). The child may want to handle the situation on their own in an attempt to regain a sense of control (StopBullying.gov, 2021b). They may also feel that it is their responsibility to solve the problem and that adults should not have to "fight their battles for them" (DeLara, 2012). It is essential that children feel supported by the adults around them, so they are comfortable asking for help when needed.

Effects of Bullying

Children who are bullied are more likely to experience health issues, depression, anxiety, and increased feelings of sadness and loneliness (Ye et al., 2023). Decreased academic achievement and school participation are other common effects of being bullied and can increase the likelihood of skipping class or dropping out of school (Samara et al., 2021). Being bullied is predictive of increased levels of violent behavior and the carrying of firearms (Limber & Nation, 1998; Sumner et al., 2022). In an analysis of 25 school shooters, 60% said that they had been bullied (Dowdell et al., 2022). Being bullied is linked to increased suicide ideation (Sun et al., 2024), but many other factors, like depression and family life, contribute to suicidal thoughts and behaviors (Edgerton & Limber, 2013).

Kids who bully others can also engage in violent and other risky behaviors into adulthood (Limber & Nation, 1998). They are more likely to engage in substance abuse as an adolescent and as an adult. They are also more likely to engage in fights, vandalize property, drop out of school, and become involved in the justice system.

Kids who witness bullying are subject to some of the same effects as those who experience the bullying themselves (Committee et al., 2016). They may have increased levels of anxiety, depression, substance use, and feelings of helplessness.

Preventing and Responding to Bullying

Bullying is a pervasive issue affecting about 1 in 4 students every year (PACER, 2023). Education and prevention programs can reduce bullying by up to 20% when implemented at schools (Gaffney et al., 2019), and these programs are most effective when they are intensive and long-lasting (Ttofi & Farrington, 2010). Prevention methods should go beyond just the schools and adolescents, though. Having a high-functioning, strong family structure is an effective preventative factor for bullying behaviors (Barbarro et al., 2020), so parental education on bullying can lower the risk of it happening (Shetgiri et al., 2013; Ttofi & Farrington, 2010). Low involvement of parents in a child's life contributes significantly to bullying behaviors (Flouri & Buchanan, 2003), so parents should strive to meet their child's friends, teach their children about consequences of their actions, and model

empathetic thinking and behavior (Education Development Center, 2016; Shetgiri et al., 2013). Through effective teaching and modeling, bullying behaviors can be heavily reduced.

The responses of adolescents and adults to bullying differ. Adolescents should do their best to disengage from the person bullying them by walking away, avoiding physical confrontation, seeking peer support, and reporting the situation to an adult (KidsHealth, 2023). The notified adult should provide empathy and support to the adolescent and intervene to stop the behavior (KidsHealth, 2023; StopBullying.gov, 2021c).

What to Do When Cyberbullying Happens

Cyberbullying is a form of bullying, so adults should take the same approach to address it: support the person being bullied and address the bullying behavior of the participants.

There is a process for responding to cyberbullying (New South Wales, 2024). First, **recognize** if there has been a change in mood or behavior in the adolescent and explore the possible cause. **Ask** questions to learn what is happening, how the cyberbullying started, and who is involved. **Document** what is happening and where, taking screenshots of harmful posts and content if possible, so that there is a record of the bullying. **Report** issues to social media platforms and refer to the school's reporting policies. If a child has received physical threats or if a potential crime or illegal behavior is occurring, report it to the police. **Provide support** by discussing an action plan to address the behavior and consider whether professional support is necessary.

Adults can help prevent cyberbullying of their children. Teach children about safe online behavior, including not clicking on links from strangers, not sharing personal information, not participating in bullying behavior of others, and what to do if they observe or experience bullying (Stopbullying.gov, 2023b). Establish rules about how much time a child can spend online (KidsHealth, 2022). Parents should remain involved by checking in periodically with children about who they are interacting with online and monitoring for any sudden behavior changes that could indicate cyberbullying (KidsHealth, 2022; Stopbullying.gov, 2023b).



Video 19.5.3.2. *Ways to Stop Bullying.* Link: https://youtu.be/ynTuA_tlZDE

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19.6: Stress, Coping and Resiliency

Learning Objectives

1. Identify common sources of stress in middle childhood.
2. Describe how children's coping strategies differ from those in earlier developmental stages.

As children's cognitive and emotional capacities mature, so too does their awareness of stressors in their environment. At this age, children begin to encounter more complex challenges—balancing schoolwork, navigating peer relationships, and coping with changes at home or in routines—all of which can generate stress. The most common stressors in middle childhood include those stemming from academic pressure, social dynamics, family changes, over-scheduling, and self-evaluative concerns, such as fear of failure and the fear of making mistakes.

Children in middle childhood are also increasingly aware of **societal or global stressors**, such as news about violence or natural disasters, which can lead to generalized anxiety or feelings of helplessness.

Compared to younger children, school-aged children tend to use more **cognitively based coping strategies**, although emotion-focused strategies remain common. Coping strategies typical of middle childhood include (Compas et.al, 2014):

- **Problem-solving**: Identifying a stressor and working toward a solution (e.g., asking for help with homework or conflict resolution)
- **Distraction or avoidance**: Playing, reading, or engaging in hobbies to reduce emotional distress
- **Cognitive reframing**: Viewing a situation from a different perspective (e.g., "Maybe I didn't win the game, but I still had fun")
- **Seeking social support**: Turning to parents, teachers, or peers for comfort or advice

However, not all coping strategies are adaptive. Some children may withdraw, ruminate, or externalize their stress through aggression or defiance, especially if they lack emotional regulation skills or a supportive environment.

Building resiliency in middle childhood is similar to previous stages, in that warm, responsive relationships set the stage for positive adjustments when working to overcome challenges. However, peer support and opportunities for mastering skills, such as academics or sports, also support resilience in middle childhood.

References, Contributors and Attributions

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20: Why Understanding Development Matters

Whether working as educators, early interventionists, healthcare providers, counselors, social workers, or family advocates, professionals who support children must have a deep understanding of growth and development. This textbook has provided a comprehensive look at the stages from prenatal development through middle childhood, emphasizing how development unfolds in physical, cognitive, language, social, emotional, and creative domains.

To effectively support children, professionals must consider foundational issues and themes, such as the role of nature and nurture, the influence of culture, and the importance of relationships. Understanding how children develop also requires a grounding in research and ethics—knowing how knowledge is generated and how children's rights and dignity must be protected in all settings.

Theories of development help professionals interpret behavior and plan appropriate support. For example, an early childhood educator might draw on Vygotsky's ideas about scaffolding to extend a child's learning, while a pediatric nurse may recognize how Erikson's psychosocial stages relate to a child's responses to hospitalization or separation.

Developmentally appropriate practices and thoughtful observation and assessment are central tools for anyone working with children. These practices ensure that services and learning environments are matched to the child's current abilities and needs. Assessment helps guide decision-making in educational and clinical contexts, ensuring that support is intentional and meaningful.

Understanding genes and the environment, as well as prenatal development and the experiences of birth and early caregiving, allows professionals to recognize early influences on later outcomes. Recognizing how stress, health, or caregiving quality in infancy can shape behavior and learning helps inform early interventions.

As children grow, they express themselves creatively and develop rapidly across all domains. Professionals must understand how growth and learning are connected and how these connections change from infancy through middle childhood. This understanding supports everything from designing engaging learning environments to making informed referrals when concerns arise.

Ultimately, knowledge of child development is not just academic—it is essential for practice. It empowers professionals to build strong relationships with children and families- creating environments that foster growth and intervening effectively when challenges arise. By understanding the complex and dynamic nature of childhood, professionals are better equipped to make a lasting, positive impact on the lives of children.

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