# Infants and Toddlers

## CAREGIVING AND RESPONSIVE CURRICULUM DEVELOPMENT

Tenth Edition

**Terri Jo Swim**

Purdue University Fort Wayne

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***Infants and Toddlers: Caregiving and Responsive Curriculum Development*,**
**Tenth Edition**
**Terri Jo Swim**

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# Brief Contents

# Contents

# Preface

This revised, expanded, and updated edition was developed with the intention of guiding the reader through the acquisition of skills necessary to provide high-quality care for infants and toddlers in any educational setting. Information based on current theories and research, as well as standards for infant-toddler teacher preparation, is reflected throughout the book. The tenth edition continues to support the book's goal of providing appropriate caregiving and educational techniques, along with curriculum ideas, for groups of very young children and for individual children within those groups. Early childhood educators, administrators, advocates, and parents will find practical information that can be put to immediate use to promote the highest quality care and education possible for all children, birth to age 3.

## Major Revisions in the Tenth Edition

As with previous editions, *Infants and Toddlers: Caregiving and Responsive Curriculum Development*, Tenth Edition, strives to bridge the gap between theory and practice. As scholar-practitioners, teachers need to use theory to inform their practice and in turn use their practice to inform theoretical understanding. Building from the strong foundation of previous editions, the text has been updated and thoroughly revised. Although notable differences set this edition apart from the previous edition, points of continuity remain. For example, in this tenth edition, the child continues to be at the center of care and education. Defining infants and toddlers as engaging, decision-making forces within their environments sets a tone of excitement and enthusiasm. No longer can we afford to agree with the description of toddlerhood as the "terrible twos." Rather, we need to embrace the image of the child as capable, competent, and creative. Doing so opens a number of educational options that were unavailable previously.

Results of research on brain structures, functions, and development as well as social and emotional development have been expanded as foundations for this edition. For example, links among cortisol levels, parenting behaviors, and child outcomes for very young children are investigated. In addition, current crises facing our world such as the COVID-19 pandemic and the need for more diversity, equity, and inclusion is addressed for children, families, and early learning centers. Respecting children; designing effective physical, social, and intellectual environments; building partnerships with families; and planning individually appropriate curricula are discussed throughout this edition.

Major content revisions in this edition also include the following:

- **NEW Spotlight on Practice features.** Based on experiences of practicing teachers, these new features in Chapters 1 thru 10 and in Chapter 12

explore how concepts in each chapter are applied when working with very young children, their families, and/or colleagues.

- **REVISED The Three *As*.** To minimize confusion between the concepts, the Three *A*s have been revised to Attention, Appreciation, and Attunement. Thus, *approval* from previous editions has been replaced with *appreciation*. The new term is being used to communicate that adults accept very young children as they are, not based on some idea of who the adult wants them to be.
- **NEW concept coverage.** Chapter 3 has a new Spotlight on Cortisol box that explores how children differ in their response to environmental factors. This section, informed by the new book, *The Orchid and the Dandelion: Why Some Children Struggle and How All Can Thrive* (Boyce, 2019), uses decades of research to understand how some children demonstrate resilience and other children are impacted greatly (both positively and negatively) by the environments in which they reside. In addition, Chapter 4 has a new Spotlight on Care and Education that invites the reader to explore their values around care and consider how those values might impact the work they do with very young children.
- **NEW research results.** Results of new research and scholarly articles have been incorporated into each chapter. For example, new research on how language development is affected by hearing loss and how children learn labels for words can be found in Chapters 2 and 12, respectfully; current thoughts about how adults and peers influence the development of prosocial behaviors is in Chapter 3; and Chapter 9 explores the concept of Sudden Unexpected Infant Death in addition to SIDS.

## Enduring Instructional Features

To help aid the student's comprehension and understanding of infant-toddler development and learning, several important instructional features continue in the tenth edition.

- **A focus on professional standards** with a Standards Correlation Chart on the book's inside front cover, which offers an at-a-glance view of where discussions related to NAEYC's Professional Standards and Competencies for Early Childhood Educators and Developmentally Appropriate Practice can be found. In addition, the DAP icon DAP focuses readers on principles of developmentally appropriate practice throughout the text.
- **Learning Objectives and Standards Addressed** are listed at the beginning of each chapter. The learning objectives correlate directly with major sections in the chapter, as well as with the Summary at the end of each chapter.

  In each chapter, the list of Standards Addressed includes the related 2019 NAEYC Professional Standards and Competencies for Early Childhood Educators, NAEYC's 2020 Developmentally Appropriate Practice, and the NAEYC standards specific to infant and toddler care.

- **Family and Community Connection** boxed feature, which is now included in every chapter, is intended to assist the readers in applying strategies for engaging family and community agencies in the care and education of young children. Each box contains a number of questions to spark thinking about important concepts.
- **A Lesson Plan** now appears at the end of each chapter and can be digitally downloaded. (They are called Professional Resource Downloads.) The goal of this feature is to provide examples of lesson plans that are grounded in observations of a young child and are respectful and engaging through the use of responsive strategies.
- **Spotlight boxed feature** highlights key research topics, professional child care organizations, and the personal experiences of child care professionals to enhance the book's real-world perspective.
- **Reading Checkpoints** included throughout each chapter help to improve comprehension by asking students to pause and consider what they have just read.
- **Case Studies** present real-life examples of the concepts and principles discussed. The content of those cases, such as diversity or special rights, is highlighted in the title of the Case Study.
- Updated references can be found at the end of the text.
- A list of developmental milestones for children from birth to 36 months is provided in Appendix A for the four major areas of development, which assists caregivers in recording observations and assessing each child's current level of development.
- Appendices C and D have been updated to provide a current list of board and picture books that are appropriate to use with infants and toddlers.
- The text is current and comprehensive so that caregivers can acquire the skills necessary to function at nationally accepted standards of quality.
- The level of the language used is easy to follow and offers practical examples for self-study by caregivers-in-training.

## Text Organization

### Part I Understanding the Foundations of Professional Education

This section prepares the reader as a professional educator who possesses the knowledge, skills, and dispositions necessary to meet effectively the developmental and learning needs of infants and toddlers. An overview of the theories and research in the fields of child development and early childhood education, including new information on brain development and attachment, helps lay that foundation.

- **Chapter 1** highlights the importance of taking a developmental perspective when working with infants and toddlers; an overview of trends in education and development that influence learning environments for very young children; and the importance of valuing cultural diversity.

- **Chapter 2** creates a framework for understanding the growth and development of physical and cognitive/language areas from birth to 36 months.
- **Chapter 3** focuses on growth and development in the emotional and social areas from birth to 36 months. In both Chapters 2 and 3, sections are devoted to expanding the readers' information on brain development.
- **Chapter 4** presents the master tools of caregiving—Attention, Appreciation, and Attunement—as a model of conscious caregiving, combining practical principles and techniques from current theories and research in the field.
- **Chapter 5** describes specific knowledge bases that professional educators acquire through informal and formal educational opportunities and how continuous professional development can help them persist in growing and learning. One such knowledge base involves the appropriate assessment of children. This chapter, then, focuses on various observational tools for tracking development and learning, and how to use the data as the groundwork for other aspects of the caregiver's work.

## Part 2 Establishing a Positive Learning Environment

Four chapters provide the reader with details about how to create appropriate environments for very young children. Learning environments include consciously building the physical, social, and intellectual elements of the classroom. No longer can professional educators attend to the physical arrangement and placement of equipment and materials to the exclusion of the socioemotional and intellectual climates created among adults and children.

- **Chapter 6** uses key components of educational philosophy found in the schools in Reggio Emilia, Italy, as the foundation for creating a caring community of learners. Respectful and effective communication and guidance strategies are explored to assist very young children in acquiring self-regulation skills.
- **Chapter 7** is devoted to appropriate communication strategies to use when creating reciprocal relationships with family members and colleagues. Family situations that may require additional support from the caregiver, the program, or community agencies are explored.
- **Chapter 8** covers components of high-quality and developmentally appropriate indoor and outdoor learning environments from the teachers', children's, and society's perspectives and presents common health and safety issues for children, including the current COVID-19 crisis.
- **Chapter 9** presents practical techniques for designing the intellectual environment. Curriculum—both routine care times and planned learning experiences—must be specially designed to enhance the development and learning of *each* child. Emphasis is placed on engaging in project work with infants and toddlers.

### Part 3 Developing Responsive Curriculum

This part explores strategies for designing curriculum that reflects current levels of development and learning and ways to scaffold to the next level of development.

- **Chapter 10** covers early intervention for infants, toddlers, and families. It explores not only how we should approach early intervention from a strengths perspective but also common characteristics of children with special rights.
- **Chapters 11–13** explore tasks, materials, and specific learning experiences to enhance development for children from birth to 36 months. Each of these chapters focuses on working with children in a one-year age range. This practical section provides specific techniques, teaching strategies, and solutions to many of the common problems confronted when addressing the rapid growth and development of infants and toddlers.
- **Chapter 14** builds on information provided throughout the text as it investigates strategies for supporting content area learning for infants and toddlers. Central concepts for emergent literacy, mathematics, fine arts, social studies, and science are provided.

## MindTap™: The Personal Learning Experience

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## Instructor and Student Resources

Additional instructor and student resources for this product are available online. Instructor assets include an Instructor's Manual, Educator's Guide, PowerPoint® slides, Professional Scenarios, and a test bank powered by Cognero®. Cengage Learning Testing Powered by Cognero is a flexible online system that allows you to author, edit, and manage test bank content from multiple Cengage Learning solutions; create multiple test versions in an instant; and deliver tests from your Learning Management System (LMS), your classroom, or wherever you want. Student assets include Professional Resource Downloads. Sign up or sign in at **www.cengage.com** to search for and access this product and its online resources.

## About the Author

**TERRI JO SWIM, PH.D.,** is a professor of early childhood education and the Associate Vice Chancellor of Academic Programs at Purdue University Fort Wayne in Indiana. She has taught in higher education institutions for more than 25 years. In addition, she has worked in private child care centers, university-based laboratory programs, and summer camps with children from birth to 13 years of age. Terri was a co-editor of *The Hope for Audacity: Recapturing Optimism and Civility in Education*. Her current research interests include infant–toddler and preschool curriculum, Reggio Emilia, documentation, and teacher education.

Questions or discussions on any topics covered in the book can be sent to her at the e-mail address below.

**TERRI JO SWIM**
**swimt@pfw.edu**

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# 1 Taking a Developmental Perspective

CHAPTER

## Learning Objectives

After reading this chapter, you should be able to:

- **1-1** Determine how the four major developmental areas for assessment differ from one another.
- **1-2** Explain the theories of child development.
- **1-3** Justify how the use of Bronfenbrenner's ecological systems theory explains current trends in development and education.
- **1-4** Recognize the impact of each individual child's culture on classroom interactions and curriculum.

## Standards Addressed in This Chapter

### NAEYC NAEYC Standards for Early Childhood Professional Preparation

**1** Child Development and Learning in Context

### DAP Developmentally Appropriate Practice Guidelines

**1** Creating a Caring, Equitable Community of Learners

In addition, the NAEYC standards for developmentally appropriate practice are divided into six areas particularly important to infant/toddler care. The following areas are addressed in this chapter: *Relationship between Caregiver and Child* and *Policies*.

Never before in our history have we known so much about the importance of the infant and toddler years. New brain scan technologies allow us to unobtrusively peak into the developing brain to understand how very young children's brains are being wired. The results show us amazing rates and patterns of development in response to the type and amount of caregiving received, the nutrition provided, and environmental factors such as the exposure to trauma, violence, or enriching experiences. The role of early childhood educators is more significant than ever. As a result, educators need to learn theories, principles, and skills to keep pace with the demands of their profession.

Child care settings are powerful contexts for influencing the development and learning of very young children. High standards require that teachers learn to take good care of both themselves and the children and to be aware of the interests, abilities, and desires of the child, family, community, and society as a whole. Part I provides current trends in caring for infants and toddlers, theories and principles of child development, and a structure for caregiving that helps prepare the caregiver for the challenging and rewarding profession of early childhood education.

This edition continues to emphasize science and new discoveries by researchers (e.g., on brain development and attachment) as well as the influences these findings have on caregiver behavior when working with very young children. By closely observing and recording the behaviors of children, the child care specialist will create a powerful framework to use in caring for and educating infants and toddlers.

When you finish Part I of this book, you'll have the knowledge and principles necessary to care for children effectively and enhance the development of each child through your direct, intentional interactions. Parts II and III build on this base of knowledge to give you all the specific skills, techniques, strategies, and activities needed to function confidently as a professional.

Even though your work is vital within your classroom and educational program, it can't stop there. Early childhood educators need to use the information gained from this text to advocate for collective responsibility and commitment to all children from birth to age 3. The next generations deserve nothing less from us.

What do people who work with young children need to know, and what do they need to be able to do? Early childhood educators[1] have long debated these questions. For almost a century, people from all areas of the field and all corners of the world have worked to answer these two key questions as well. Current research has helped early childhood specialists clearly define a core body of knowledge as well as standards for quality in both teacher preparation and in programming for young children. Scholarly research has validated what early childhood professionals have always known intuitively: the quality of young children's experience in early care and education settings is directly related to the knowledge, skills, and dispositions of the adults caring for them.

Today's theories and philosophies regarding child development and learning have evolved over time and have been influenced by both

[1]In this book, the terms *early childhood educator, teacher, caregiver,* and *primary caregiver* will be used interchangeably to describe adults who care for and educate infants and toddlers. Other terms, such as *early childhood specialist*, *educarer*, *practitioner*, *staff*, *child care teacher*, *head teacher*, *assistant teacher*, or *family child care provider*, might also be familiar. The use of these four terms is not intended to narrow the focus of professionals discussed in this book or to minimize a particular title; rather, the purpose is to provide some consistency in language.

ancient and modern society and thought. They are the direct result of early childhood professionals and scientists building on previous theories and research to better understand children today.

How teachers use and apply the developmental theories depends not only on their understanding of those theories and associated research but also on their personal beliefs and dispositions. Because we are unable to attend to every aspect of an interaction, our mind filters and categorizes information at astonishing speeds. Our beliefs impact not only how our brain does this work but also how we make sense of the information after it is available. Matusov, DePalma, and Drye (2007) suggest that adults' responses constantly and actively impact the trajectory of development of children. Thus, teachers participate in "co-constructing the observed phenomenon of development" (p. 410) such that "development defines an observer no less than the observed" (p. 419). In other words, what we observe and what we think the observations mean are as much a reflection of us (our beliefs and knowledge bases) as it is a reflection of the child we observed. This is illustrated in conversations between two adults after observing the same event. They each describe the actions, behaviors, and implications of the phenomenon differently. Thus, recognizing how teachers shape the development of children must subsequently result in the opening of dialogue and communication.

These points are made so that you'll take an active role in reflecting on your own beliefs and how they are changing as you read this book and interact with infants and toddlers. Developing the "habit of mind" for careful professional and personal analysis will assist you in thinking about your role as an educator.

## 1-1 Developmental Areas

The structure of this book allows for the philosophy that the author believes is most helpful in early learning settings. The major contributions of early childhood theorists are presented within this structure. This philosophy, which follows a *Developmental Perspective*, states that teachers and other adults must be consciously aware of how a child is progressing in each area to create environments that facilitate the child's ideal development. Unlike the *tabula rasa* theory of the past, which claimed that children are molded to parental or societal specifications, current research indicates that each child's genetic code engages in a complex interaction with environmental factors to result in the realization (or not) of the child's full potential.

A child born with a physical disability such as spina bifida may not realize as much potential in certain areas as a child born without a disability, and a child whose ancestry dictates adult height less than five feet will most likely not realize the potential to play professional basketball. However, within these limiting genetic and environmental factors, every child has the potential for a fulfilling and productive life, depending on how well the child's abilities are satisfied and challenged, and to what extent the skills necessary to become a happy and successful adult are fostered by family members and caregivers.

As you can see, from the moment of birth, the child and the people around the child affect each other. This dynamic interaction is sometimes deliberate and controlled and sometimes unconscious behavior. Caregivers working with infants and toddlers plan many experiences for children. Simultaneous with these planned experiences are the thousands of actions

that are spontaneous, that stimulate new actions and reactions, and that challenge both the child and the caregiver. Teachers must learn to be mindful in all of their interactions.

Magda Gerber (Gerber & Weaver, 1998) has established an approach and structure for child care that emphasizes mindful interaction between child and caregiver. This approach is illustrated through her "10 principles of caregiving."

1. Involve children in activities and things that concern them.
2. Invest in quality time with each child.
3. Learn the unique ways each child communicates with you and teach the child the ways you communicate.
4. Invest the time and energy necessary with each child to build a total person.
5. Respect infants and toddlers as worthy people.
6. Model specific behaviors before you teach them.
7. Always be honest with children about your feelings.
8. View problems as learning opportunities and allow children to solve their own problems where possible.
9. Build security with children by teaching trust.
10. Be concerned about the quality of development each child has at each stage.

Interactions that reflect these principles focus on the development of the whole child; that is, attention to cognitive development is not at the expense of social or physical development. When teachers who are new to the profession are required to think about all of the areas of development at once, they can become overwhelmed. Child development knowledge, in this situation, can be divided into distinct, yet interrelated, areas for easy understanding. It is important to note that no area of development functions in isolation from another. This division is arbitrary and is done for the ease of the learner, you. For children, the areas of development come together and operate as a whole, producing an entirely unique individual. Table 1–1 lists the four developmental domains that will be used in this book. Coming to understand the four individual areas well is necessary for you to promote optimal development for each child in your care.

A major goal of this book is to help caregivers understand normal sequences and patterns of development and to become familiar with learning tools that enhance development in the four major developmental areas.

**TABLE 1–1** ◗ Developmental Domains

| | |
|---|---|
| **AREA I** | **Physical:** height, weight, general motor coordination, brain development, and so on |
| **AREA II** | **Emotional:** feelings, self-perception, confidence, security, and so on |
| **AREA III** | **Social:** interactions with peers, elders, and youngsters, both one-on-one and in a group, social perspective-taking, and so on |
| **AREA IV** | **Cognitive/Language:** reasoning, problem solving, concept formation, verbal communication, and so on |

After you understand the normative patterns or **milestones**, you can more easily recognize and honor the unique patterns that each child demonstrates. Throughout this book, you'll learn to evaluate the development of an individual child by comparing observed behaviors with the larger group that was used to establish normative behavior for that age. Therefore, necessary aspects of preparing to be an infant/toddler teacher are learning to observe children carefully, record those observations, and analyze that data. After individual parts are understood, early childhood educators can apply the knowledge to care for the whole, constantly changing child in a competent manner.

**milestones** Specific behaviors common to a population that are used to track development and are observed when they are first or consistently manifested. Milestones can vary by race/ethnicity, so understanding the population characteristics is important for decision making.

# 1-2 Theories of Child Development

## 1-2a Historical Theories of Child Development

Before the Reformation in sixteenth-century Europe, little importance was placed on children; they were considered little adults. With the Reformation and the Puritan belief in *original sin* came harsh, restrictive child-rearing practices and the belief that it was the "duty of the responsible adult to control the child's willfulness and stifle acting-out urges with stern, powerful, and consistent discipline" (Lally, 2006, p. 10).

The seventeenth-century Enlightenment brought new theories of human dignity and respect. Young children were viewed much more humanely. For example, John Locke, a British philosopher, advanced the theory that a child is a *tabula rasa*, or blank slate. According to his theory, children were not basically evil but were completely molded and formed by their early experiences with the adults around them (Locke, 1690/1892).

An important philosopher of the eighteenth century, Jean-Jacques Rousseau, viewed young children as *noble savages* who are naturally born with a sense of right and wrong and an innate ability for orderly, healthy growth (1762/1955). His theory, the first child-centered approach, advanced an important concept still accepted today: the idea of **stages** of child development.

**stages** Normal patterns of development that most people go through in maturation, first described by Jean-Jacques Rousseau.

During the late 1800s, Charles Darwin's theories of *natural selection* and *survival of the fittest* strongly influenced ideas on child development and care (1859/1936). Darwin's research on many animal species led him to hypothesize that all animals were descendants of a few common ancestors. Darwin's careful observations of child behaviors resulted in the birth of the science of child study.

## Spotlight on Practice

### Voices from the Field

Wei is a new graduate student at a Midwestern university. She is studying early childhood education and has a job as a teaching assistant in the university child development center. During her first couple of weeks in the center, she notices that the teachers refrain from giving children rewards for doing what is expected or punishing them for doing something wrong. This is different from her experiences growing up in China. When she talks with the lead teacher, Wei learns that a focus is placed on more contemporary theories of child development such as Piaget (children construct their own understanding) and Vygotsky (adults scaffold more appropriate behavior). What other theories should Wei consider when thinking about how to facilitate development and why?

At the turn of the twentieth century, G. Stanley Hall was inspired by Darwin. Hall worked with one of Darwin's students, Arnold Gesell, to advance the *maturational perspective* that child development is genetically determined and unfolds automatically—leading to universal characteristics or events during particular time periods (Gesell, 1928). Thus, Hall and Gesell are considered founders of the child study movement because of their **normative approach** of observing large numbers of children to establish average or normal expectations (Berk, 2012). At the same time, in France, Alfred Binet was establishing the first operational definition of intelligence by using the normative approach to standardize his intelligence test.

**normative approach** Observing large numbers of children to establish average or normal expectations of when a particular skill or ability is present.

In contrast to the normative approach, **behaviorism** explores how the environment impacts the development of learning of each child. John Watson, the father of behaviorism, in a historic experiment, taught an 11-month-old named Albert to fear a neutral stimulus (a soft white rat) by presenting the rat several times accompanied by loud noises. Watson and his followers used experiments in *classical conditioning* to promote the idea that the environment is the primary factor determining the growth and development of children. Skinner and Belmont (1993) expanded Watson's theories of classical conditioning to demonstrate that child behaviors can be increased or decreased by applying *positive reinforcers* (rewards), such as praise, and *negative reinforcers* (punishment), such as criticism and withdrawal of attention.

**behaviorism** School of psychology that studies stimuli, responses, and rewards that influence behavior.

## 1-2b Contemporary Theories of Child Development

### Social and Emotional Theories

**Attachment theory**, developed by John Bowlby, is based on the premise that infants need a strong emotional attachment to their primary caregiver. This theory examines how early care, especially relationships between adults and children, impacts later development (Photo 1–1). Bowlby (1969/2000), after observing children between the ages of one and four years in post–World War II hospitals and institutions who had been separated from their families, concluded that "the infant and young child should experience a warm and continuous relationship with his mother (or permanent mother substitute) in which both find satisfaction and enjoyment" to grow up mentally healthy (p. 13). Relying heavily on *ethological* concepts, he proposed that a baby's attachment behaviors (e.g., smiling, crying, clinging) are innate and that they mature at various times during the first two years of life (Bowlby, 1958). The ethological purpose of these behaviors is to keep the mother close and therefore stay out of harm's way (Honig, 2002). However, the quality of

**attachment theory** A theory that infants are born needing an emotional attachment to their primary caregiver.

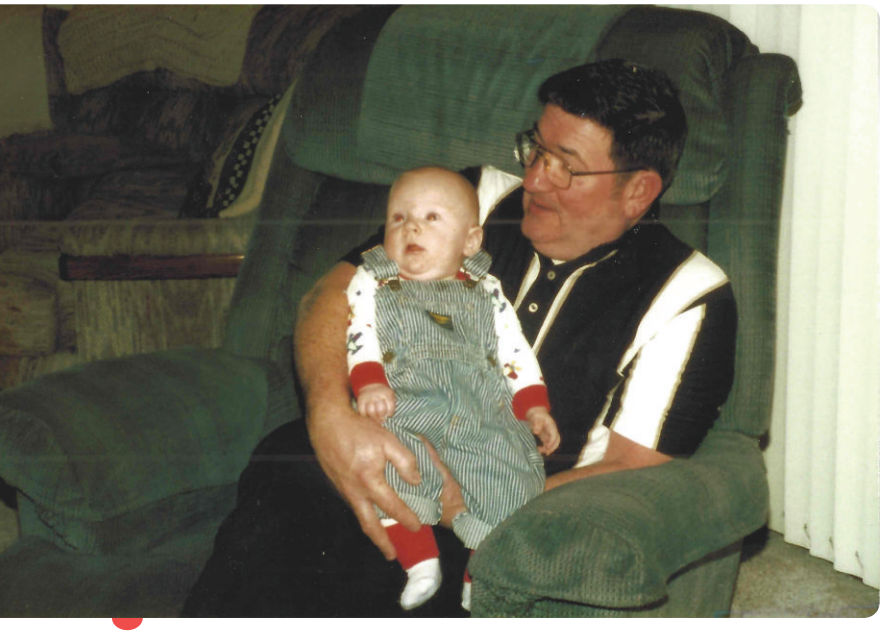

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**PHOTO 1–1** A grandparent can share in caring for an infant.

attachment is not just determined by the infant's behavior. The caregiver's responses to the attachment behaviors serve to create a foundation for their relationship to develop (see Oppenheim & Koren-Karie, 2002). Attachment history has been associated with emotional, social, and learning outcomes later in life (see Copple, 2012) and has been very influential on classroom practices, especially the concept of continuity of care.

Erik Erikson created the **psychosocial theory** of child development. Erikson's (1950) theory, which is still used in child care today, predicted several stages of development, including the development of trust, autonomy, identity, and intimacy. Each stage is characterized by a crisis between two outcomes, such as when an infant has to resolve the issue of trust versus mistrust. The resolution at each stage is impacted by the quality of caregiving. In addition, the outcome of earlier stages influences later stages, resulting in a domino effect. In other words, how these stages are dealt with by family members and teachers determines an individual's capacity to contribute to society and experience a happy, successful life.

**psychosocial theory** Erikson's stage theory of development, including trust, autonomy, identity, and intimacy.

During the 1950s, **social learning theories** became popular. Proponents of these theories, led by Albert Bandura, accepted the principles of behaviorism and enlarged on conditioning to include social influences such as *modeling, imitation,* and *observational learning* to explain how children develop (Grusec, 1992). Bandura suggested learning is not determined by forces outside of the child but that it depends on the child attending to someone's behavior (e.g., watching others; Charlesworth, 2017). Through observation, children gather information from others on how to accomplish tasks and then must mentally work to coordinate and integrate the learning (Charlesworth, 2017).

**social learning theories** A body of theory that adds social influences to behaviorism to explain development.

## Cognitive Theories

Jean Piaget is one theorist who has influenced the modern fields of child development and care more than any other. **Cognitive developmental theory** predicts that children construct knowledge and awareness through manipulation and exploration of the environment, and that cognitive development occurs through observable stages (Beilin, 1992). Piaget's stages of cognitive development have stimulated a significant body of research to understand how children use diligent research to answer the questions that challenge them (e.g., where did the ball go?). Teachers should view very young children as active participants in their own growth and development. Piaget's contributions also suggest that teachers should intentionally

**cognitive developmental theory** Piaget's theory that children construct knowledge and awareness through manipulation and exploration of their environment.

- Create environments conducive to learning;
- Provide materials and experiences to foster thinking and problem solving;
- Encourage children to be persistent when trying to construct their own knowledge (i.e., do not supply the "right" answer for them) by asking questions; and
- Help children extend their own ideas or thinking with new materials or experiences (Charlesworth, 2017).

The next cognitive theory, **sociocultural theory**, was developed by a Russian psychologist, Lev Semenovich Vygotsky, who hypothesized that culture,

**sociocultural theory** Vygotsky's theory on development that predicts how cultural values, beliefs, and concepts are passed from one generation to the next.

## Spotlight on Research

### Essential Life Skills for Infants

Ellen Galinsky outlines in her book, *Mind in the Making: The Seven Essential Life Skills Every Child Needs* (2010), what parents, educators, and community members must know to help children grow and develop optimally. She expertly weaves together research on brain development, social development, emotional development, and environmental influences on those processes to draw her conclusions. As the title indicates, there are seven essential life skills that must be developed for young children:

- Focus and controlling oneself
- Perspective taking
- Communicating
- Making connections
- Critical thinking
- Taking on challenges
- Self-directed, engaged learning

One overarching theme of this book is recognizing and building on the competencies of very young children. Research continues to illuminate how children have remarkable skills long before they can articulate what they are thinking. For example, infants and toddlers are capable of demonstrating brain functions that manage attention, emotions, and behaviors in pursuit of goals (i.e., executive functions) (p. 39); 18-month-old children can take the perspective of an adult (p. 81); infants can read adults' emotional cues to differentiate a range of emotions (p. 113); 6-month-old babies have number sense and can distinguish an array of 8 versus 16 dots (p. 169); and 6- and 10-month-old infants demonstrate people sense when they indicate a preference for the character in a play that helped another (rather than the character who hindered another; pp. 212–213).

A significant contribution of this book is Galinsky's description of the seven essential life skills as being "social-emotional-intellectual (SEI) skills" (p. 71). In other words, current research has elucidated how these essential life skills reflect the multifaceted interplay between those three areas of development. Parents, teachers, and community members can no longer continue to treat these complex skills in simplistic and isolated ways; we must recognize how each area of development works with other areas to result in complex understanding and behaviors.

This book not only blends data generated from rigorous research with interviews of those researchers but also provides practical suggestions that parents and teachers can use to promote brain development via these seven essential skills. For example, Chapter 1 provides 19 suggestions to promote the development of focus and self-control such as encouraging pretend play because it promotes the development of the working memory and playing sorting games with changing rules because they support cognitive flexibility. Critical thinking (Chapter 5) can be supported by promoting curiosity, learning from "experts," evaluating information from others, and being a critical viewer of television and other media.

The last essential skill (self-directed, engaged learning) is of particular importance for teachers of infants and toddlers. Galinsky makes the case that research supports seven principles that help "children unleash their passionate desire to learn" (p. 300). The following are some of those principles:

- Establish a trustworthy relationship with each child.
- Help children set and work toward their own goals.
- Involve children socially, emotionally, and intellectually in learning.
- Elaborate and extend their learning.
- Help children become increasingly accountable for their own learning.

When teachers act intentionally to support children's learning about their passions (e.g., cars for one child, cats for another), they open up new worlds of understanding in areas such as mathematics, history, literacy, and science that will serve them for a lifetime.

meaning the values, beliefs, and customs of a social group, is passed on to the next generation through social interactions between children and their elders (1934/1986). Those social interactions must be at the appropriate level for learning to occur. Adults must observe and assess each child's individual levels of performance as well as the child's assisted levels of performance. The data gathered assist with determining what supports (also known as scaffolding) are necessary for promoting learning (Berk & Winsler, 1995; Bodrova & Leong, 2007), symbolic thought (Brofman,

Rabinovitch, & Karpov, 2018), social or emotional development, such as self-regulation (Brofman, et al, 2018; Morcom, 2014), and play (Leong & Bodrova, 2012). Scaffolding can come in the form of questions, suggestions, coaching, or physical supports. Peers, while not as sophisticated as adults, also scaffold new learning or skills as they support and guide each other.

Cross-cultural research has supported this theory through findings that young children from various cultures develop unique skills and abilities that are not present in other cultures (Veraksa & Sheridan, 2018; Berk, 2012).

## Ecological Theory

The **ecological systems theory** was developed by Urie Bronfenbrenner, an American psychologist. Bronfenbrenner (1995) expanded the view of influences on young children by hypothesizing four nested structures that affect development (see Figure 1–1). At the innermost level is the **microsystem**, which comprises patterns of interactions within the immediate surroundings of the child. This system includes families, early childhood educators, direct influences on the child, and the child's influence

**ecological systems theory** Bronfenbrenner's theory of nested environmental systems that influence the development and behavior of people.

**microsystem** Bronfenbrenner's term for the innermost level of influence found in the immediate surroundings of the child, such as parents or an early childhood educator.

**FIGURE 1–1** ◗ Model of Urie Bronfenbrenner's Ecological Systems Theory

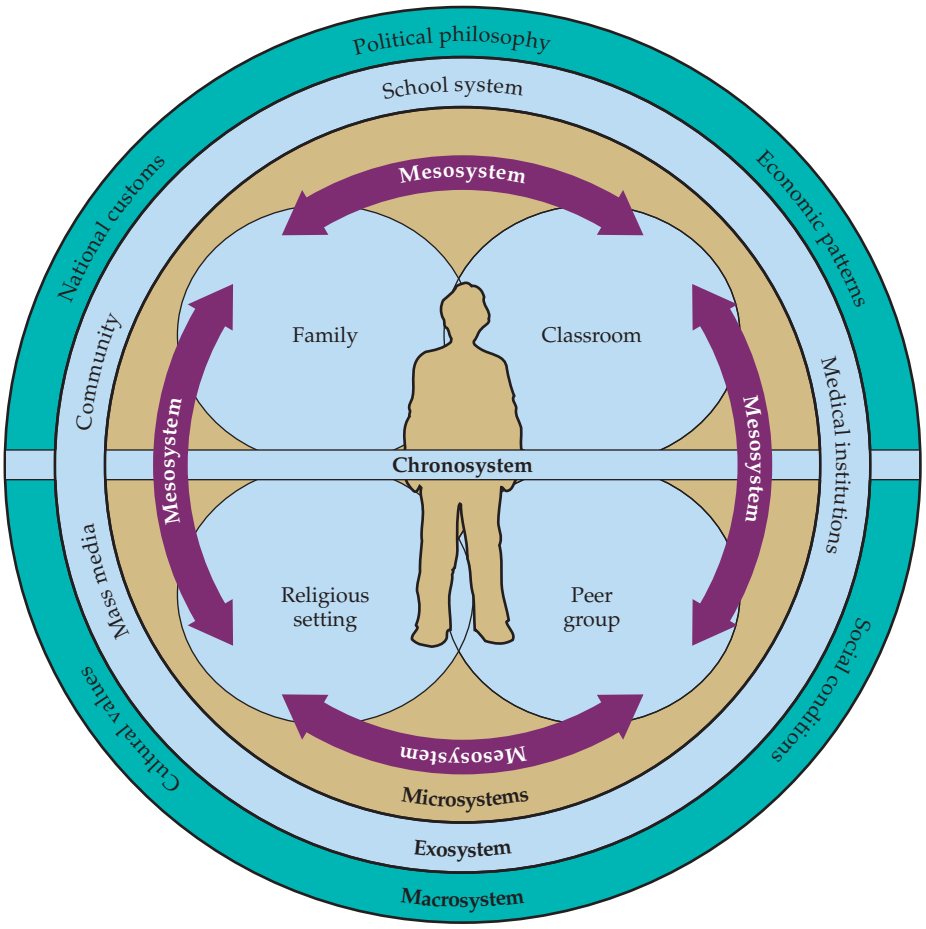


**FIGURE 1–2** ◗ Continuum for the Controversy of Universal versus Unique Development


**mesosystem** Bronfenbrenner's term for the second level of influence for the child that involves interactions among microsystems, such as a teacher in a child care center and family members.

**exosystem** Bronfenbrenner's term for the influences that are not a direct part of a child's experience but influence development, such as parent education.

**macrosystem** Bronfenbrenner's term for influences on development from the general culture, including laws and customs.

on the immediate environment. The **mesosystem** is the next level of influence and includes interactions among the various microsystems. For example, family and teacher interactions in the child care setting represent connections between home and school that impact the child's development. The **exosystem** includes influences with which the child is not directly involved that affect development and care, such as parent education, parent workplace, and the quality and availability of health and social services. The **macrosystem** consists of the values, laws, resources, and customs of the general culture in which a child is raised. This theory has wide applications in understanding and categorizing the factors that affect child care.

## 1-2c Unique Patterns of Development

These theories differ in their view of various controversies in development. For the purposes of this chapter, the focus will be placed on the controversy of universal versus unique patterns of development. Theories on the universal end of the continuum (see Figure 1–2) state that development stages or accomplishments are common to all children. As you can tell from the preceding descriptions, some theorists such as Piaget and Gesell describe development as occurring in set patterns for all children. In other words, there are universal trends in cognitive reasoning and physical development. From these perspectives, if you know a child's age, you can predict with some degree of confidence how that child might think or act.

**PHOTO 1–2** Toddlers share many characteristics, yet they are all developmentally unique.

On the other end of the controversy, theories espousing a unique view of development suggest that patterns of development cannot be determined or predicted because environmental factors impact each child differently. Ecological systems and sociocultural theories are both examples on this end of the continuum. These theorists did not believe that teachers could predict a child's behaviors or abilities by knowing a child's age or stage of development. Each child is unique in the progression of skills, knowledge, and behaviors (Photo 1–2).

Some theories of development are at neither end of the continuum. Rather, they fall somewhere in the middle, suggesting that development is representative of both controversies. Attachment theory, for example, is based on the belief that all children experience similar phases; yet, the relationship each child has with caregivers greatly impacts the type of attachment displayed.

It must be kept in mind that the United States is a world leader in the fields of child development and care, but we cannot assume that research findings on developmental skills and abilities from one group of children (e.g., Caucasian children in the United States) directly apply to other cultures or subcultures (Diaz Soto & Swadener, 2002; Fleer & Hedegaard, 2010; Lee & Johnson, 2007; Matusov et al., 2007). Only through taking a developmental perspective and paying close attention to universal and unique patterns of development as well as cultural influences will we be able to determine the practices to optimally enhance the growth and development of individual infants and toddlers.

**Reading Checkpoint**

Before moving on with your reading, make sure that you can answer the following questions about the material discussed so far.

1. Justify why infant-toddler teachers should employ a developmental perspective in their work.
2. Explain what the four developmental domains are and why it is useful, yet artificial, to divide development in this manner.
3. Select two developmental theories. Compare and contrast them; in other words, explain how they are alike and how they are different.

## 1-3 Current Trends in Development and Education

Current child care trends considered in this section reflect the research being completed concerning brain development, attachment theory, and sociocultural theory. All of these trends are discussed within the framework of the ecological systems theory: microsystem, mesosystem, exosystem, and macrosystem. In this theory, human relationships are described as bidirectional and reciprocal. *Relating* is the act of being with someone and sharing the same space and setting, expressing needs and accepting responsibility for interacting with each other. Interactions are respectful to all parties involved.

The recommendation to respect children is also expressed by the educational leaders of the infant and toddler centers of Reggio Emilia, Italy. These professionals believe that all children have rights, which include, among other things, the right to be held in high regard and treated respectfully. This book emphasizes that the teacher be mindful of positive intentions toward the child and engage in reflective, careful planning, resulting in good outcomes for both.

### 1-3a Microsystem Trends

DAP

Trends in the microsystem involve effects that adults and children have on each other. For example, an adult who consciously uses attention,

approval, and attunement with children elicits a positive response from them. Any third party who is present may also be affected. How this person is affected is determined by whether or not the reciprocal relationship is positive or negative. If the people interacting are supportive, the quality of the relationship is enhanced.

The microsystem is the closest system to the child. It contains the child, the immediate nuclear family, and others directly related to the child. Development of the child is directly impacted by the contexts in which the child is being raised and the child directly impacts those same contexts. In other words, bidirectional influences are at play. Gabbard and Krebs (2012) theorized about the importance of considering physical development from Bronfenbrenner's perspective. They suggest that family members can constrain development (e.g., placing an infant in a crib for long periods of time), or they can support and enhance development (e.g., providing toys, materials, and space that encourage a variety of motoric activities). Yet, a child that craves movement can resist being placed in a crib for too long, resulting in an adult changing the child's location and providing new physical experiences.

Bidirectional impacts also impact brain development. Noninvasive neuroscience imaging techniques have significantly impacted our understanding of brain development. It was once believed that nature, or the basic genetic makeup of a child, played a dominant role in determining both short- and long-term cognitive developmental outcomes. Now we know that nurture, or environmental variables, impacts these same outcomes. For example, scientists have found that prenatal stress (Van den Bergh, van den Heuvel, Lahti, Braeken, de Rooij, Entringer, et al., 2020; Van den Bergh, Dahnke, & Mennes, 2018) and harmful, stressful, or neglectful behaviors early in life can affect the development of the brain, potentially leading to lifelong difficulties (Carlson, Hostinar, Mliner, & Gunnar, 2014; Catale, Gironda, Lo Iacono, & Carola, 2020; Ranger, 2019). The quality and consistency of early care will affect how a child develops, learns, copes with, and handles life. The more quality interactions you have with the children in your care, the more opportunities you create for positive development.

Working families need access to high-quality child care programs for their very young children. Child care settings, then, are an important aspect of the microsystem. Unfortunately, access to high-quality care programs is "out of reach for all but the most privileged, hampering women's labor force participation" due to a lack of investment in child care infrastructure in the United States (Malik, 2021). Additionally, systems for assisting families with limited income with the cost of child care have been underfunded for so long that now only 1 in 7 eligible children receives a subsidy (Chien, 2020). When families can afford child care, they tend to participate most frequently in center-based care, followed by relative care, and then nonrelative care. These children have widespread cultural differences in customs, family structure, and parenting styles. For example, children experience living with one parent, two parents, or grandparents. In addition, more and more children grow up experiencing poverty (see Table 1–2). Respectful, mindful teachers are necessary in all child care settings to promote interest, acceptance, and attachment among children and families.

**TABLE 1–2** ◗ Facts and Figures on Families in the United States with Infants and Toddlers

| All Infants and Toddlers |
|---|
| Each day in America[a]:<br>678 babies are born without health insurance.<br>827 babies are born into extreme poverty and 1,541 babies are born into poverty.<br>860 babies are born with low birthweight.<br>2 mothers die from complications of childbirth.<br>59 babies die before their first birthday.<br>5 children die every day from child abuse. The highest rate of child abuse is for children under age one. In addition, 70.3 percent of all child fatalities were younger than 3 years old. |
| Approximately 20 percent of 2-year-olds are not fully immunized. National coverage by age 24 months shows that ≥90 percent of children have received the expected doses of poliovirus vaccine, hepatitis B vaccine (HepB), varicella vaccine (VAR), and measles, mumps, and rubella vaccine (MMR), although MMR coverage was <90 percent in 14 states, putting those states at higher risk for measles outbreaks. In addition, only 1.2 percent of children had received no vaccinations by age 24 months; this was influenced by access to health care with 1.4 percent of unvaccinated children being uninsured. |
| Among all infants and toddlers, 67 percent of infants and toddlers live in families who are experiencing low income (100–199 percent federal poverty level; FPL), poor (50–99 percent FPL), or deep poverty (less than 50 percent FPL); 11 percent have no access to health insurance. |
| **Infants and Toddlers in Poverty** |
| Of the infants and toddlers in the United States, 67 percent are in families that are low income, poor, or in deep poverty. Children under the age of 3 are more likely to live in poverty than older children. Poverty, however, is related to race and ethnicity, with African American, American Indian, and Hispanic infants and toddlers being more than twice as likely to live in poverty as young White children. In addition, 45 percent of children with immigrant parents live in low-income families. |
| Most poor infants and toddlers live in families where at least one adult works. Thirty-five percent of low-income families have at least one parent who works full-time, year-round. |
| Nationally, in 2018–19, 163,126 infants and toddlers participated in Early Head Start programs. This represented less than 8 percent of infants and toddlers who were eligible to be served. |
| In 2018, 3 million children age 5 and under participated in the WIC program. |

[a]Based on calculations per school day (180 days of seven hours each).
Sources: National Center for Children in Poverty. (2021). Basic facts about low-income children: Children under 18 years, 2019 and Young children in deep poverty: Racial/ethnic disparities and child well-being compared to other income groups. Retrieved June 3, 2021, from http://www.nccp.org/; Children's Defense Fund. (2021). The state of America's children. Retrieved June 3, 2021, from http://childrensdefense.org; Centers for Disease Control and Prevention. (2020). Vaccination Coverage by Age 24 Months Among Children Born in 2016 and 2017—National Immunization Survey-Child, United States, 2017–2019. Retrieved June 3, 2021, from https://www.cdc.gov/mmwr/volumes/69/wr/mm6942a1.htm; National Vital Statistics Reports (2021). Births: Final data for 2019. 70(2). Retrieved June 3, 2021 from https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-02-508.pdf; American Society for the Positive Care of Children (2021). Child maltreatment statistics. Retrieved June 3, 2021 from https://americanspcc.org/child-abuse-statistics/.

Attachment research (to be reviewed in the next section) explains that infants can form positive, secure relationships with both family members and early childhood educators. Child development experts now understand that close relationships between toddlers and a teacher are not a substitute for parent-child relationships; rather, they can support and enhance

**PHOTO 1–3** Close relationships between toddlers and teachers support and enhance parent-child relationships.

each other (Photo 1–3). Now such experts encourage important practices such as family grouping, continuity of care, primary caregiving, and creating partnerships with families to minimize the effects on children of long hours away from family members.

## Family Grouping

DAP

**family grouping** Method for grouping children where children are of different ages.

When a small number of children of different ages (e.g., infants and toddlers) are cared for in the same room, it is called **family grouping**. Such arrangements reproduce relationships that children naturally have in a home setting. For example, families often have siblings who are two or fewer years apart in age. Organizing the program so that the six children who share the room vary in age from a very young infant (e.g., 6 weeks) to 3 years of age provides opportunities for interactions that are similar to those that may be found more naturally.

## Continuity of Care

**continuity of care** Having the same teachers work with the same group of children and families for more than one year, ideally for three years.

Attachment theory suggests that infants, toddlers, and adults need time to create positive emotional bonds with one another. Having the same teachers work with the same children for a three-year period is one way to promote strong attachments (Bernhardt, 2000; Honig, 2002). This type of arrangement is often referred to as **continuity of care** and should be viewed as a primary component of high-quality programming for very young children. As this term suggests, the emphasis is placed on building and maintaining relationships for long periods of time—these relationships are between teachers and children, teachers and family members, and between the children (Nitecki, 2017; see Photo 1–4). With older children,

this is often referred to as *looping*. Continuity of care can appear in several different forms in practice. For example, a teacher and her group of children could remain in one classroom for the infant and toddler years, changing furniture, instructional tools, and supplies as needed to respond to the developing capabilities of the children. In contrast, a teacher and her group of children could move each year into a new classroom, which already is equipped with age-appropriate furniture, supplies, and materials. In either case, emphasis is placed on building strong, stable, and secure attachments between the caregiver and child throughout the first three years of life. Unfortunately, when infants and toddlers experience too many changes in caregivers, they can become reluctant to form new relationships, and their optimal social and emotional development is impeded.

Ross Heater

**PHOTO 1–4** Family child care programs naturally support family grouping and continuity of care as children from the same family can be cared for together over several years.

National statistics suggest that many infants and toddlers do not experience continuity of care. According to Choi, Horm, and Jeon (2018), 29 percent of Early Head Start programs in their sample reported no centers implementing continuity of care practices, while 57 percent of programs reported all of their centers implemented these practices. Of the programs implementing continuity of care, 29 percent of the children experienced no change in teachers, 34 percent experienced one change, and 37 percent experienced two to six teacher changes (Choi et al., 2018). This research demonstrates that continuity of care is not uniformly implemented across Early Head Start programs and about one-third of all children in the programs studied experienced multiple teacher changes, which could negatively impact their social and emotional development. Some reasons for a lack of continuity in child care centers are explored next.

Implementing continuity of care might seem simple, yet it requires a great deal of organizing and changing policies on the part of a center-based program (see, e.g., Nitecki, 2017). To illustrate, practices for hiring often have to change (e.g., hiring teachers of "children from birth to age 3," rather than an infant teacher), and communication with families has to include a rationale for this approach. The program also has to respond to changes in external policies that impact the program. In the state of Indiana, for example, child care licensing regulations require that all programs make a "reasonable effort" toward implementing continuity of care for children up to 30 months of age. Research indicates that while many programs say that they are doing continuity of care, the majority of them did not keep infants or toddlers with their teacher when they moved to the next class (Ruprecht, 2011). The imprecision of the licensing regulations may be influencing how programs define and implement this concept.

Looking more broadly at policy issues can also demonstrate how regulations can impact the continuity of care a child receives. When the state of Oregon decided to develop more generous child care subsidy policies for how to use federally funded Child Care and Development Funds, the goal

was to increase parents' child care options by allowing them access to care they believed was best for their child. The impact on the policy was found to be twofold (Weber, Grobe, & Davis, 2014). First, more families selected center-based care for their toddlers. Second, the children had more stable participation in the program selected by their family. Thus, while the state policies were not about continuity of care within any specific classroom, the increase in consistent funding led to more consistent participation in the child care programs. While changes in state licensing regulations and subsidy policies are often welcomed by many professionals, more work needs to be done to assist program directors and teachers in executing continuity of care in practice and to research the impact of such changes on child outcomes.

## Primary Caregiving

**primary caregiving system**
Method of organizing work in which one teacher is primarily responsible for half of the children, and the other teacher is primarily responsible for the rest.

Another way to help adults bond with infants is to divide the work using a **primary caregiving system** (Kovach & De Ros, 1998). In this method, one teacher in the room is primarily responsible for half of the children, and the other teacher is primarily responsible for the rest. While a teacher would never ignore the expressed needs of any infant or toddler, the teacher is able to invest time and energy into coming to understand a smaller group of children and their families. Frequently, the primary caregiver is the person responsible for providing assistance during routine care times such as diapering, feeding, or napping. According to teachers, the primary caregiving system is valuable because it helps them maintain a balance between their routine work and their availability to be responsive to the children (Ebbeck & Yim, 2009). While this research suggests that teachers value the primary caregiving system, recent research from Indiana suggests they are still working to align behaviors that would support such a system. State licensing regulations require that each infant and toddler classroom use a primary caregiving system and that the assignments are posted for families. When asked what other behaviors the teachers engage in to support these relationships, teachers reported that they document daily activities, provide information on the child's development, and sit with the care group during meals (Ruprecht, 2011). They were less likely to report that they were responsible for changing diapers, soothing the child to sleep, interacting with the child, and talking to parents on a daily basis. It appears that teachers need support in defining and carrying out behaviors that would promote their role as a primary caregiver.

An important aspect of implementing a primary caregiving system is strong communication and collaboration between the adults in the classroom. When adults know children well, they can communicate with each other quickly about next steps or how to divide tasks. For example, if three children are still eating snacks, and four children are ready to go outside, the adults can determine who should stay inside to finish the snack and clean the tables for the next learning experience and who should go outside and support outdoor learning. In addition, the adults can be flexible in helping each other meet the children's needs. For example, when the primary caregiver is unavailable, the other adult can "fill in" and express willingness to assist the child instead. Thus,

the adults have modeled a sense of working together, communication, and everyone pitching in to finish all that needs to be accomplished.

## 1-3b Mesosystem Trends

The mesosystem reflects the relationships between the various components of the microsystem. In other words, at the mesosystem level, we have to consider bidirectional influences between family, peers, school, and so on. Of particular importance for early childhood educators is the relationship that teachers have with families. The transition between home and school should be smooth and continuous. The only pathway for achieving this is through *partnering* with families. Families are experts on their children; recognizing and using this can improve your effectiveness as a caregiver. On the other hand, you are an expert on this time period—infancy and toddlerhood—given your experiences with numerous children of this age and your intentional study of child development. Help family members bring their strengths to the relationship. Valuing each family's child-rearing practices while helping them to understand child development is not only respectful but also part of your ethical responsibility (NAEYC, 2011).

**PHOTO 1–5** Infants, toddlers, and adults need time to create positive emotional bonds with one another.

Positive relationships within the mesosystem level have been shown to result in benefits for children, families, teachers, and programs (Photo 1–5). Used in combination, the effects of each setting can be particularly strong. The reason for highlighting the relationships between the systems is to help you understand that the purpose of child care is not to replace familial influences on very young children but to enhance them.

### Family and Community Connection

Think back to your experiences as a young child. Go as far back in your memory as possible. Feel free to ask a family member for assistance if necessary or desired. What were your experiences like? Where, for example, did you live, and with whom did you live? What did that person or those persons do to earn money? What type of community agencies did you participate in most often (e.g., public library, food banks, social service agencies)?

How do you think your experiences as a young child have shaped the person you are today? How do those experiences impact, both positively and negatively, your understanding of and interactions with very young children and their families? In addition, how might it impact your knowledge of the resources available in your community?

## 1-3c Exosystem Trends

The exosystem refers to social settings that do not contain the child but still directly affect the child's development, such as parent workplace, community health services, and other public agencies. To illustrate, the impact of being a child in a military family depends on where the child is at developmentally because the timing of separations and reunifications in military families matters (Masten, 2013). Growing evidence suggests that stress in a pregnant mother can alter development in the fetus with lasting effects on mental health and brain development (Van den Bergh et al., 2018, 2020). Very young children are sensitive to the effects of prolonged separations during the period when attachment bonds are forming. In addition, when toddlers lack the ability to understand information related to the deployment, it can result in a sense of abandonment, confusion, and emotional turmoil or anxiety. Thus, "different developmental stages bring different vulnerabilities and capacities that may affect how a child responds to deployment experiences" (Paley, Lester, & Mogil, 2013, p. 254).

The exosystem structure also manifests itself in the work of professional organizations that lobby and advocate for quality child care services. Many local, regional, and national organizations stress child care advocacy that sets higher standards of care, along with education that touches each child in the community. NAEYC, for example, has created standards defining high-quality early educational programs. The accreditation process is a way for programs to demonstrate they are providing exceptional care and educational experiences for young children (NAEYC, 2019). Hence, this organization, while a part of the exosystem, can directly impact the work of teachers in early education programs. Moreover, NAEYC works with numerous agencies to advocate for early childhood educators in the Power to the Profession initiative.

Being an advocate yourself might seem like an overwhelming task. However, each time you interact with family members, colleagues, and community members, you are a teacher-leader. Your dedication to applying and sharing professional knowledge and practices makes you an advocate for young children, families, and the early childhood profession.

## Spotlight on Organizations

### WestEd's Program for Infant/Toddler Care

WestEd is a nonprofit agency whose mission is to work with education and other communities to promote excellence, achieve equity, and improve learning for children, youth, and adults. As one way to achieve this mission, WestEd has created a training series for infant and toddler teachers called Program for Infant/Toddler Care (PITC). This program provides ongoing training and professional development opportunities that ensure that America's infants get a safe, healthy, emotionally secure, and intellectually rich start in life.

The PITC is based on current research that espouses the importance of responsive, respectful, and relationship-based care for infants and toddlers. Currently, this agency is conducting a research study to evaluate the implementation of PITC teachers' caregiving strategies. In other words, they are seeking to understand whether their intensive training has a positive impact on the way their graduates build relationships with and create meaningful environments for very young children. For more information on this agency, go to the Program for Infant/Toddler Care website.

### 1-3d Macrosystem Trends

Next we turn to trends within the macrosystem, the most general level of Bronfenbrenner's ecological systems theory. The child is ultimately affected by decisions made at this level because the macrosystem consists of the laws, customs, and general policies of the social system (government). This is where the availability of resources (money in particular) is determined. The macrosystem structure of the United States has gone through remarkable changes over the past 10 to 20 years.

Early Head Start (EHS), which started in 1994, is a federally funded program for low-income pregnant women and families with infants and toddlers. This program evolved from the Head Start program and the clear need to provide early intervention for children and families. In 2018–19, EHS provided enrollment for 166,693 infants, toddlers, and pregnant women nationwide (Office of Head Start, 2019). While that number may sound impressive, it represents less than 10 percent of the eligible families. EHS and all other early learning centers need to expand access to and affordability for families. Unfortunately, programs cannot do this alone; quality child care is expensive. As mentioned previously, infrastructure and funding for high-quality child care has lagged behind the need for decades. Research shows that high-quality, affordable child care is essential brain food for each child; it should not be a luxury that only some families can afford. We need to take the bold step as a nation to invest in our youngest citizens and their caregivers. To that end, President Joe Biden has included $39 billion in the American Rescue Plan to help child care programs recover from the COVID-19 crisis. In addition, the proposed Child Care for Working Families Act (CCWFA) would

- ease the burden on families, giving parents the opportunity to provide the security and stability that encourage healthy child development;
- combat deep economic inequality while helping address long-standing racial, gender, and geographic disparities in the U.S. economy;
- create good-paying early care and education jobs, which means not only higher quality child care but also job growth for the economy (Malik, 2021).

## 1-4 Valuing Cultural Diversity

Our nation is increasingly diverse, beginning from birth. In other words, the infant-toddler population is more diverse than older generations. In 2015, just over half—50.2 percent—of U.S. babies younger than 1 year old were from underrepresented groups (Cohen, 2016). In 2018, for the first time, the White population comprised less than 50 percent of the under age 15 population (49.9 percent; Frey, 2019). Regardless of our racial or ethnic identity, we must take steps to learn about those who are different from ourselves. As always, we must start from a place of respect and value for each person. A culturally rich curriculum encourages the recognition of cultural differences and helps young families connect with the traditions of their own heritage and culture. It is important for teachers to develop a curriculum that reflects the core beliefs, values, and caregiving practices

for families. This will not be without challenges as you negotiate your beliefs and the family members' beliefs.

Humans draw upon their own cultural model for behavior that is both relevant and meaningful within their particular social and cultural group; early educators are no exceptions. The knowledge and understanding that caregivers use with families is drawn primarily from two sources: their educational or learned knowledge base and their personal experiences as family members and educators. Therefore, we need to recognize and continually reexamine the way we put our knowledge into practice. We need to develop **scripts** that allow us to learn more about families' cultural beliefs and values regarding the various aspects of child rearing. In other words, we must create a method or sequence of events for getting to know each family. That way, we can understand the family's actions, attitudes, and behavior, as well as their dreams and hopes for their child.

**scripts** A method or sequence of events to learn more about each family's cultural beliefs and values regarding the various aspects of child rearing.

Consideration of cultural models can help us bring coherence to the various pieces of information that we are gathering about families and organize our interpretation of that information. Organizing and ongoing reflection on what parents tell us about their strategies can help us discover their cultural model for caregiving, and then we can compare it with the cultural models that guide our own practice (Finn, 2003).

We caregivers must recognize the richness and opportunity available to us in our work with families of diverse ethnic, racial, and cultural groups (Photo 1–6). We can learn the different ways that families provide care for their children when they are all striving toward similar goals: happy and healthy children who can function successfully within the family culture and the greater community. We can use that knowledge to construct a cultural model of culturally responsive practice, designed to support families in their caregiving and assist them in meeting their goals for their children (Finn, 2003; Rothstein-Fisch, Trumbull, & Garcia, 2009).


**PHOTO 1–6** More children with a wide diversity of backgrounds are in early childhood education programs.

Bronfenbrenner's ecological systems theory assumes the interconnectedness of each person to others and examines the ways in which one system affects another. It recognizes the importance of respecting each individual's uniqueness and considers carefully the decisions made at every level that affect us all. This theory helps us understand that children are not passive recipients of whatever happens in their environment but are very involved in influencing their environment and aiding their own development. It is important for the primary caregiver to understand that even newborns have a part in their own growth and development. Infants' wants, needs, and desires must be respected.

Take it as your individual responsibility to be aware of the power of your

actions and their immediate and future impact on children. When you see that the early childhood educator also influences the family and community, you can truly understand the old African saying, "It takes a village to raise a child." This often-quoted saying is a simple way to understand that Bronfenbrenner's term *bidirectional* describes the relationships that influence a child—occurring between child and father, child and teacher, child and school—and explains that the influences go both ways.

Before moving on with your reading, make sure that you can answer the following questions about the material discussed so far.

1. Explain at least four current trends in early care and development.
2. How does the diversity of families in today's society influence early education programs and teachers?

**Reading Checkpoint**

## Summary

### 1-1 Determine how the four major developmental areas for assessment differ from one another.

Educators must come to understand how patterns of development within the four major areas, physical, emotional, social, and cognitive/language, are useful to their work with young children. When teachers working with infants and toddlers adopt a developmental perspective, they are more apt to address the capabilities of the children in their care. Teachers and other adults must be consciously aware of how a child is progressing in each area to create environments that facilitate the child's ideal development.

### 1-2 Explain the theories of child development.

This chapter also provided an overview of major developmental theorists and theories that impact teacher behaviors and classroom practices. Some theorists and theories were presented to provide a historical understanding of past reasoning about young children. Other theorists and theories were used to outline a more contemporary understanding of young children, their families, and contextual impacts on both.

### 1-3 Justify how the use of Bronfenbrenner's ecological systems theory explains current trends in development and education.

Bronfenbrenner's theory was used as a framework for understanding contextual variables that directly and indirectly impact children's development.

### 1-4 Recognize the impact of each individual child's culture on classroom interactions and curriculum.

Early childhood education programs serve children from a wide diversity of backgrounds. As a result, there is an increased need for teacher education regarding how to create culturally responsive practices and materials in child care curricula.

CASE STUDY

## Trisha

### Applying Bronfenbrenner's Theory

Trisha works at the Little Folks Child Care Center as an assistant teacher while she attends classes at a local community college to earn her associate's degree in early childhood education. She was surprised to learn that her center was using family grouping with continuity of care. Although she always knew that she had the same children from the time they enrolled until they were around 3 years old, she did not know it was associated with a particular term or of such great educational value. Currently, she assists the head teacher with caring for eight children who range in age from 8 weeks to 17 months. Like those in the rest of the program, this group of children is culturally diverse. Trisha has worked with parents, staff, and the children on multicultural issues; she always attempts to learn more about each culture represented in her room. As part of a course, she organized a tool for gathering information about child-rearing practices and used the results to individualize routine care times.

As she has learned new ideas, such as the primary caregiving system, accreditation standards, and Bronfenbrenner's ecological systems theory, she has assumed a more active role in the microsystem. She has repeatedly discussed with her director and lead teacher the need to reduce the number of infants and toddlers per classroom to six and to adopt a primary caregiving system. Although they are enthusiastic about learning more about the primary caregiving system, they have not yet seriously considered cutting the class size by two children per room, due to financial concerns.

1. Provide two examples of how Trisha has, in her words, "assumed a more active role in the microsystem."
2. In what other systems does Trisha work? Provide examples for each system you identify.
3. What might be the added benefits of the center adopting a primary caregiving system even if it is not possible for them to reduce the number of children in each room?

## Additional Resources


Adamo, S. M. G., & Rustin, M. (2018). *Young child observation: A development in the theory and method of infant observation* (1st ed.). Routledge.

*Engaging young children: Lessons from research about quality in early childhood education and care.* (2018). OECD.

Ferguson, S. J. (Ed.). (2018). *Shifting the center: Understanding contemporary families* (5th ed.). Sage.

Howes, C. (2010). *Culture and child development in early childhood programs: Practices for quality education and care*. Teachers College Press.

Lally, J. R. (2013). *For our babies: Ending the invisible neglect of America's infants.* Teachers College Press.

Lynch, E. W., & Hanson, M. J. (Eds.) (2011). *Developing cross-cultural competence: A guide for working with children and their families* (4th ed.). Paul H. Brookes.

Raikes, H., & Edwards, C. P. (2009). *Extending the dance in infant and toddler caregiving: Enhancing attachment and relationships*. Brookes.

Stern, D. N. (2018). *The interpersonal world of the infant: A view from psychoanalysis and developmental psychology* (1st ed.). Routledge.

# 2 CHAPTER Physical and Cognitive/Language Development

## Learning Objectives

After reading this chapter, you should be able to:

- **2-1** Discuss the differences between development and learning.
- **2-2** Investigate typical patterns of physical development between birth and 36 months of age.
- **2-3** Deconstruct typical patterns of cognitive/language development between birth and 36 months of age.

## Standards Addressed in This Chapter

### NAEYC NAEYC Standards for Early Childhood Professional Preparation

**1** Child Development and Learning in Context

### DAP Developmentally Appropriate Practice Guidelines

**2** Teaching to Enhance Each Child's Development and Learning

In addition, the NAEYC standards for developmentally appropriate practice are divided into six areas particularly important to infant/toddler care. The following area is addressed in this chapter: *Policies*.

## 2-1 Differences between Development and Learning

As mentioned in Chapter 1, developmental theories differ on a number of controversies. That chapter discussed universal versus unique patterns of development. In this chapter, we will investigate briefly the nature versus nurture controversy. Some theorists contend that child development is the result of heredity and natural biological processes, largely independent of learning and experience (nature), whereas others argue that development mostly depends on learning (nurture) (Charlesworth, 2017). The best conclusion to date is that child development is a complex process that involves nature and nurture as well as consideration of other factors such as health, race, social position, and culture (Charlesworth, 2017).

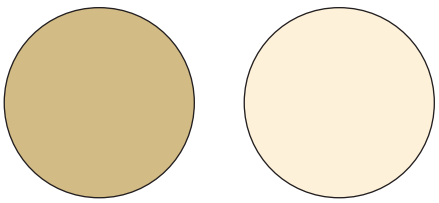
**development** Operationally defined as general sequences and patterns of growth and maturity.

**learning** The acquisition of new information through experiences, investigation, or interactions with another.

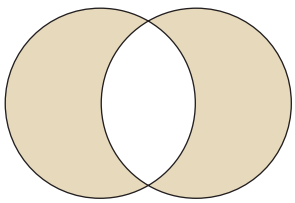
Based on the nature-nurture complexity, this book defines **development** as cumulative sequences and patterns that represent progressive, refined changes that move a child from simple to more complex physical, cognitive, language, social, and emotional growth and maturity. It is recognized that although children grow in the developmental areas in the same general sequences and patterns, each child is affected differently by social, cultural, and environmental influences. Children move through these developmental sequences at widely varying rates.

**FIGURE 2–1** Possible Conceptualizations of the Relationship between Development and Learning

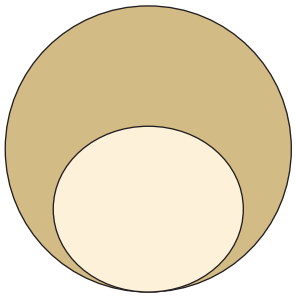
**A** Separate concepts



**B** Overlapping concepts



**C** Nested concepts



In contrast, **learning** is operationally defined as the acquisition of knowledge and skills through systematic study, instruction, practice, and/or experience. As such, learning requires action by a learner. According to a blog by Boller (2012), "learning implies 'I' am doing something. I am taking part and doing the work." This definition takes into consideration both overt behavioral changes in responses and more internal changes in perceptions resulting from practice or conscious awareness, or both. In other words, changes in a response to a stimulus either can be observable to another person (overt) or can occur internally without obvious change in observable behavior (internal). Both overt and internal learning occurs during the first three years of life. Therefore, caregivers must consistently observe the child closely to understand how changes in responses create the perceptions, thoughts, beliefs, attitudes, feelings, and behaviors that constitute the young child's evolving map of the world. The biggest challenge for early childhood specialists is to understand each child's individual map for development and learning because no two individuals can have the same one.

Figure 2–1 represents three different ways to conceptualize the relationship between development and learning. Given the definitions provided for each, which representation do you think fits best and why?

# 2-2 Patterns of Physical Development

Physical development, which includes brain development, physical characteristics, sensory, and motor, will be discussed in this chapter. Other aspects of physical development, such as teething and elimination control, will be discussed in future chapters.

## 2-2a Brain Development

The nervous system is responsible for communication among all body parts and ultimately with the environment. This section defines and familiarizes the reader with the major nervous system functions. Newborns are complex beings whose growth and development are closely related to the health and integrity of the nervous system, which is made up of the brain, the spinal cord, and nerve cells (neurons).

Brain development is particularly intense during the last weeks of gestation and the first years of life. This is evidenced by the nonlinear growth in the cranial perimeter and in the brain's weight. According to Dubois, Dehaene-Lambertz, Kulikova, Poupon, Huppi, and Hertz-Pannier (2014), the cranial perimeter grows about 14 cm during the two first postnatal years, followed by only 7 cm until adulthood (5.52 and 2.76 inches, respectively). At birth, the brain weighs 25 percent of an adult's, and by 24 months, it has tripled its weight, being about 80 percent of an adult's. Both of these changes can be attributed to growth in the brain's white matter. Specifically, brain cells called *glia* are coated in a fatty sheathing called *myelin*. Myelin is a substance that protects, coats, and insulates neurons, helping connect impulses from one neuron to another. These impulses are coded information lines that function like insulated electrical wires, carrying vital current to where it is needed in the body and brain. The myelin coating promotes the transfer of information from one neuron to another. This process, however, is not entirely under the control of genetic codes or biologically driven factors because the human brain is not fully formed at birth. This allows environmental stimuli to influence the development of the human brain.

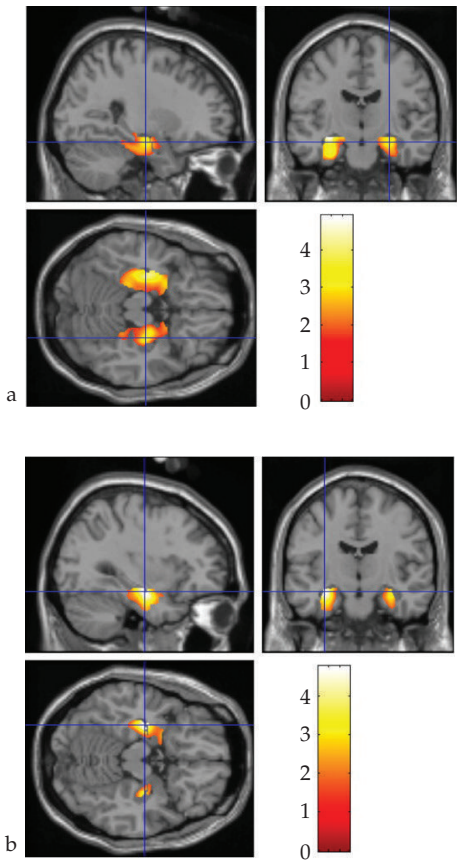
Motor neuron pathways, for example, apparently expect specific stimuli at birth. These pathways are called **experience-expectant**. The environment provides expected stimuli; for example, reflex sucking during breastfeeding is experience-expectant. Infant survival obviously depends on experience-expectant pathways. Another set of neuron pathways, called **experience-dependent**, seems to wait for new experience before activation. Specific experience-dependent cells form synapses for stable motor patterns only after environmental stimuli are repeated several times. When stimulation from the environment occurs in a consistent way, a stable pathway is created, and physical changes occur in the nervous system.

**experience-expectant** Type of motor neuron pathway that apparently expects specific stimuli at birth.

**experience-dependent** Type of motor neuron pathway that waits for environmental experiences before being activated.

As mentioned in Chapter 1, technological advancements have led to a better understanding of how brain development results from complex interactions between nature (i.e., genetic makeup) and nurture (i.e., environmental factors). Whereas genes are initially responsible for the basic wiring of the human brain, by the end of the eighth week of pregnancy, the foundation for all body structures, including the brain and nervous system,

**FIGURE 2–2** ◗ Structural MRI Comparing Hippocampal Volume




is evident in the growing fetus. The electrical activity of brain cells while still in the womb changes the physical structure of the brain, just as it will facilitate learning after birth.

Using MRI technology, toddlers (18–22 months) who were born at a very low birth weight were compared to full-term babies and found to have differences in the volume of their brain structures (Figure 2–2). Some structures were larger, and other structures were smaller (i.e., cerebral and cerebellum white matter, thalamus, and hippocampus) (Lowe, Duvall, MacLean, Caprihan, Ohls, Qualls, et al., 2011). The important conclusion from this research is that both biological and environmental factors interact in complex ways, resulting in different developmental trajectories.

The human brain is organized into regions that are predetermined for specific functions. For example, all individuals have a language and an emotion center. However, environmental stimuli affect how these centers will develop due to which neurological circuits are activated and the number of times they are used (Fox, Levitt, & Nelson, 2010; Meyer, Wood, & Stanley, 2013). At birth, the brain is packed with an estimated 100 billion neurons whose job is to store and transmit information. The newborn's brain is constantly taking in information available in the environment, utilizing all existing senses. The brain records these pieces of information, whether they are emotional, physical (sensory), social, or cognitive in origin. This information influences the shape and circuitry of the neurons, or brain cells. The more data taken in, the stronger the neuron connections and pathways become. A repeated behavior or the consistency of a behavior increases the chance of the pathway becoming strong.

The brain has two specific yet different modes for responding to environmental inputs. First, the neural pathways that are not consistently used will be eliminated, or **pruned**. Many more neural pathways exist in the brain than are efficient. When there is not a consistent pattern of stimulation for some neural pathways, the brain's job is to cut off the circuitry to that area. This process streamlines children's neural processing, making the remaining circuits work more quickly and efficiently (Zero to Three, 2012). The second mode is called **brain plasticity**. This concept refers to the process of adaptation; when one part of the brain is damaged, another part of the brain takes over the functions of the damaged area. It also means that if a major change occurs in the environment, infants can form new neural pathways to adapt to the change. By gaining a deeper understanding of brain plasticity, better therapies can be developed to improve **hemiparesis** caused by cerebral palsy or childhood strokes (Johnston, 2009). Unfortunately, the human brain doesn't have infinite capacity to change; not all damage can be compensated for, and not all neural pathways can be replaced. What this means for us as caregivers is that infants and toddlers

**prune** The elimination of neural pathways that are not consistently used.

**brain plasticity** When one part of the brain is damaged, other parts take over the functions of the damaged parts.

**hemiparesis** Slight paralysis or weakness affecting one side of the body.

are in the process of forming nerve pathways, and by providing them with the proper nutrition and experiences, we can influence the quality of their brain development.

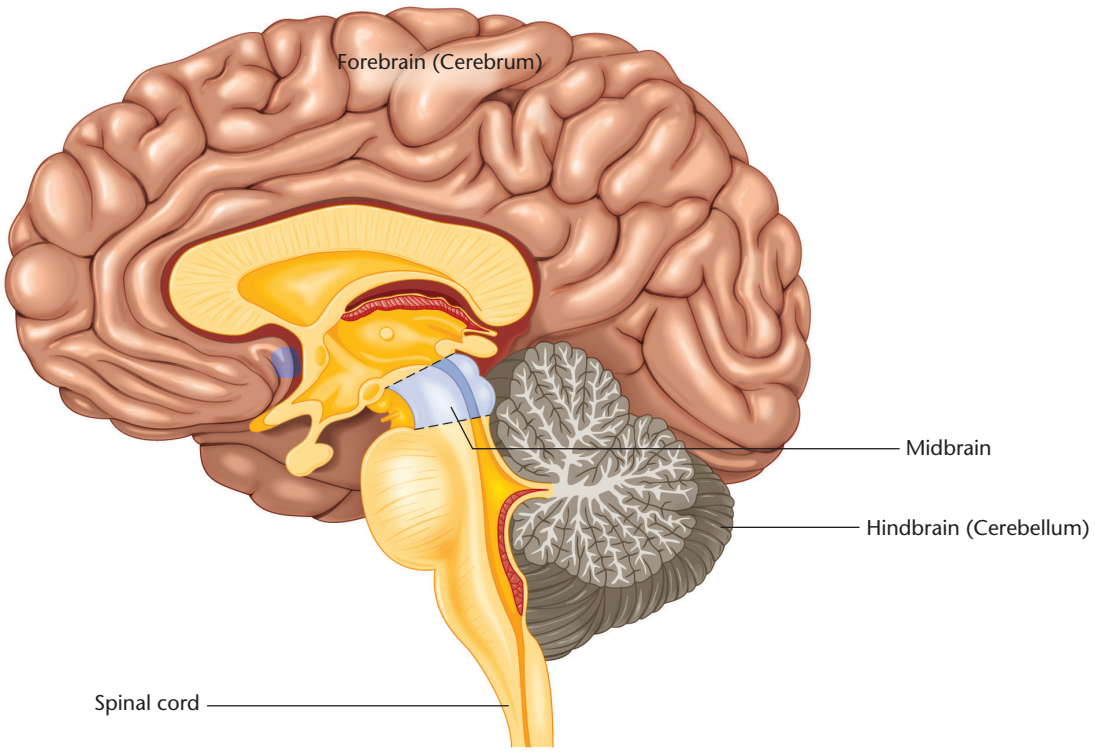
The nervous system is the "command center" for all the vital functions of the body. Pathways and networks of neurons must be organized to carry coded information from the brain to all body parts and vice versa. The brain is comprised of complex systems that interact with each other and with other parts of the body to create all thoughts, feelings, actions, and reactions (Figure 2–3). For ease of understanding, the brain is discussed here as being divided into three main parts; each part is further divided into specialized regions with specific functions. The **hindbrain** is responsible for regulating automatic functions, such as breathing, digestion, alertness, and balance. This part of the brain also controls motor movement coordination and muscle tone in an area referred to as the cerebellum. This is also the site for storing emotional knowledge. Another part of the brain, called the **midbrain**, controls visual system reflexes (e.g., eye movements, pupil dilation), auditory system functions, and voluntary motor functions. In addition, the midbrain connects the hindbrain to the forebrain. Like an old-time telephone operator's switchboard, this part of the brain tells the forebrain what messages from the hindbrain to respond to. The **forebrain** is what distinguishes our species as human; it contains the cerebral cortex, which produces all of our complex thoughts, emotional responses, decision-making, reasoning, and communicating.

**hindbrain** The portion of the brain responsible for regulating automatic functions and emotional knowledge; contains the cerebellum, which controls motor movement coordination and muscle tone.

**midbrain** The portion of the brain that controls visual system reflexes, auditory functions, and voluntary motor functions; connects the hindbrain to the forebrain.

**forebrain** The portion of the brain that contains the cerebral cortex, which produces all of our complex thoughts, emotional responses, decision-making, reasoning, and communicating.

**FIGURE 2–3** ◗ The Human Brain




From BANICH/COMPTON, Cognitive Neuroscience, 3E.

## Family and Community Connection

As mentioned previously, most family members do not always recognize or understand the importance of brain development in the first three years of life. What could you do with the families you work most closely with to change that situation? Consider what information you would share and how you would share it.

Now think about how to share this information with your greater community. How would you go about setting up a brain development event? Who in the community would you expect to target? Do you want to focus, for example, on grandparents or business owners? What information would you share with this audience, and how would you share it? Find at least two local, state, or national organizations that you could partner with to bring this information to your community.

Considered the most important part of the brain, the cerebral cortex is the slowest growing and largest part. Around 12 months, the cerebral cortex begins to organize and specify functions for neuron activity. Other parts of the brain continue to grow rapidly only through the second year, whereas the cerebral cortex continues to grow until the fourth decade of life.

The cerebral cortex receives stimuli in the form of sensory information. Associations are formed between the thought processes and physical actions or experiences. Specific areas of the cerebral cortex control special functions, such as planning, problem solving, and decision making (frontal lobes); vision and color recognition (occipital lobes); receiving and processing sensory information (parietal lobes); and emotional responses, memory, and production of language (temporal lobes). Neurological development of these specialized areas follows predictable patterns as the overall development of the child progresses due to related brain development.

DAP

Brain development during infancy is best promoted when caregivers engage in developmentally appropriate practices, especially those associated with creating positive relationships with very young children. Responsive adults tend to provide infants proper nutrition; protect them from harm and excessive stress; soothe them when they are distressed; and talk about objects, patterns, or people who have attracted their attention (Prado & Dewey, 2012; Shore, 2003; Troller-Renfree, Brito, Desai, Leon-Santos, Wiltshire, Motton, et al., 2020). Infants rely on adults to help them regulate their emotions, toddlers are exploring their new freedoms of mobility, and teachers provide a pivotal role in it all. Watch what they are trying to do and find ways to support them without being intrusive. When they have mastered a task, challenge them to go to the next level. For example, when infants are able to push up, adults can lay them on their bellies with an interesting toy or mirror at their sight level. During such interactions, adults need to provide support and guidance that is nurturing, responsive, and reassuring. Thus, responsive caregiving by parents, teachers, and others is a major factor in brain development. Competent caregivers for infants and toddlers recognize the impact they have on the children's neurological growth; they initiate activities that reinforce the natural sequences of behaviors supporting healthy growth in all areas. The adult role is critical because early experiences significantly affect how each child's brain is wired (Bernier, Calkins, & Bell, 2016; Patterson & Vakili, 2014; see also Fox et al., 2010, and Meyer et al., 2013, for reviews). Positive social, emotional, cognitive, language, and physical experiences all work together

## Spotlight on Shaken Baby Syndrome

### Causes and Effects

Approximately 1,300 infants in the United States experience severe or fatal head trauma each year as the result of abuse (National Center on Shaken Baby Syndrome, nd). **Shaken baby syndrome** occurs when a baby or child is violently shaken by an adult or older child. Damage can occur if the shaking lasts for only a few seconds. According to the Centers for Disease Control and Prevention (CDC, n.d.), children under the age of 1 (especially babies ages 2 to 4 months) are at greatest risk of injury from shaking. Shaking them violently can trigger a "whiplash" effect that can lead to internal injuries. An infant's neck muscles aren't strong enough to provide sufficient support for the head; violent shaking "pitches the infant's brain back and forth within the skull, sometimes rupturing blood vessels and nerves throughout the brain and tearing the brain tissue. The brain may strike the inside of the skull, causing bruising and bleeding to the brain" (KidsHealth, 2014b, para. 7).

This syndrome can result in death or severe and irreparable damage. Some common outcomes include the following:

- Blindness
- Developmental delays (any significant lags in a child's physical, cognitive, behavioral, emotional, or social development, in comparison with norms) and learning disabilities
- Cerebral palsy
- Severe motor dysfunction (muscle weakness or paralysis)
- Spasticity (a condition in which certain muscles are continuously contracted—this contraction causes stiffness or tightness of the muscles and may interfere with movement, speech, and manner of walking)
- Seizures (CDC, n.d.)

Shaken baby syndrome does not result from normal parent-child play interactions such as tossing a baby in the air or bouncing the baby on your knee (CDC, n.d.; Kids Health, 2014) or by accidental falls (Yamazaki, Yoshida, & Mizunuma, 2014). It is believed to be the result of at least one abusive event. However, recent research questions how the label of Shaken Baby Syndrome is applied because of bias (Lynøe, Elinder, Hallberg, Rosén, Sundgren, & Eriksson, 2017) and questionable allegations by health-care professionals (Högberg, Eriksson, Högberg, & Wahlberg, 2020). More research needs to be conducted to better understand this phenomenon and its long-term impacts on the development and learning of infants.

with the child's biological and genetic makeup to influence the development of a healthy brain. Nutrition plays an important role as well. Helton, Cross, Vaughn, and Gochez-Kerr (2018) found a "significantly greater impact of food neglect on cognitive and language development as compared to other types of maltreatment" (p. 237). As you will explore in more depth later, the prevention of developmental and learning issues through high-quality adult-child interactions and healthy environments is always preferred over providing intervention services later (Hyson & Biggar Tomlinson, 2014).

**shaken baby syndrome**
Damage that occurs when a baby or child is violently shaken by an adult or older child.

## 2-2b Physical Growth

Human babies are different from those of any other species because they can't stand immediately after birth and so can't get themselves out of harm's way. Physical growth in terms of body weight, however, occurs at an astounding rate during the first 12 months of life when infants are physically nurtured and active. Height usually parallels weight, so children who gain weight slowly in the first three years also tend to grow in height slowly. In general, babies gain an average of 10 inches in height and triple their birth weight during their first year (KidsHealth, 2014a). Growth slows significantly during the toddler years, as often does the child's appetite. Caregivers should be aware that large variations occur in the rate of physical growth in children under 3 years of age. Growth spurts and plateaus are

normal for development of height, weight, activity levels, and so on; therefore, the caregiver should keep careful records of observations of physical growth and share them with parents on a regular basis.

As you have no doubt observed, the newborn's head is the largest part of the body. Babies often look disproportional when the head is compared to the rest of the body. Even though the head is large, it is not fully developed. At birth, the bones in the baby's head are not fused; rather, "soft spots" are found in the front and back of the head. The back soft spot closes after a few months, but the front spot stays soft for almost two years. These soft spots allow space for the growth of the brain (especially from the myelinization process) as described previously. Adults must protect the baby's head from bumps and falls, and they must never shake a baby for any reason.

**reflexes** Automatic responses that are present at birth.

Almost all infants are born with well-defined **reflexes** or automatic responses. These responses are important when the infant is faced with particular environmental stimuli because they are not yet able to think through and coordinate a response. For example, if a bright light is shone in infants' eyes, they will automatically close their eyes. Or, if a finger is placed in their mouth, they will begin to suck without thinking.

Several reflexes form the beginnings of more complex behavior. In other words, they change from involuntary reactions to purposeful, intentional actions that support the growing child over time. For example, the rooting and sucking reflexes that are initially necessary for feeding can be combined with the ability to bring the hand to mouth so that the older infant can comfort themself.

The purposes of other reflexes are less well understood. The plantar grasp reflex, to illustrate, is evident when the sole of the foot is stroked causing the toes to flex. How this reflex assists the newborn is not well understood. However, an absent or weak reflex can be a sign of neurological problems.

**PHOTO 2–1** Talk with infants about what interests them, such as what they are looking at or what they are hearing.

## 2-2c Hearing and Vision Development

Newborns respond to a range of sounds. They startle easily with sudden loud noises and become agitated at high-pitched noises. They turn their heads to locate sound and show interest in their caregivers' voices (Photo 2–1). Infants explore their own utterings and use their bodies and toys to play with sound. Infants who are later discovered to be deaf or have impaired hearing coo and babble according to expected developmental patterns for the first few months. As hearing children increase their quantity and variability of babbling, deaf or hard-of-hearing children actually decrease (Marschark, 2007). This is why hearing problems can be difficult to detect until 7 or 8 months of age, even with universal newborn hearing screenings. For children who underwent routine screening (e.g., at the hospital after birth or at well-baby checkups), the diagnosis for severe to profound hearing loss was 6.8 months, while children who did not have such screening were not diagnosed, on average, until 20.5 months (Canale, Favero, Lacilla, Recchia, Schindler, Roggero, et al., 2006). While it might seem counterintuitive that early screening does not result in a diagnosis until six months later, it is important to consider that at least one follow-up

## Spotlight on Research

### Vision in Infants and Toddlers

Infants use their eyes from birth, although their vision develops relatively slowly. By the fourth month, coordination of both eyes can be observed. Four-month-old infants demonstrated similar looking preferences as adults when given simple visual, black-and-white displays (Chien, Palmer, & Teller, 2005). They focus well with both eyes at a distance of 12 inches, the normal distance for breastfeeding. By age 2, vision is around 20/80; 20/20 acuity is not expected until they are school age.

In one of the most comprehensive studies to date, Hatton, Ivy, and Boyer (2013) investigated 5,931 children age 3 and younger with severe, uncorrectable visual impairments in the United States. They discovered that the three most prevalent diagnoses were cortical visual impairment, retinopathy of prematurity (ROP), and optic nerve hypoplasia. For those children whose legal blindness status was known, 60 percent were identified as legally blind. In addition, they found that a diagnosis of a vision impairment was made at the mean age of 4.9 months. As you may recall, this is approximately two months sooner than a hearing impairment diagnosis is typically made. However, similar to a hearing impairment, referrals did not result in entry into a specialized intervention program until, on average, six months later. A recent review of literature on interventions for toddlers with visual impairments concluded that, because of the specialized need for early communication and the development of strong social relationships, practices within the child's natural environment and the parent-child relationships are especially important (Ely & Ostrosky, 2018).

evaluation must be conducted to determine the type and severity of the hearing impairment (Vos, Lagassea, & Levêquea, 2014). Late diagnosis has implications for the impact of early intervention strategies on improving speech, language, and cognitive development outcomes as well as the quality of parent and infant life (Canale et al., 2006; Lachowska, Surowiec, Morawski, Pierchała, & Niemczyk, 2014; Vos et al., 2014).

When infants with hearing aids were compared to peers with no hearing loss, both sets of infants preferred listening to infant directed speech when they were around 9 months of age; however, older infants (17 months on average) showed no preference, listening to infant directed speech and adult directed speech the same (Wang, Bergeson, & Houston, 2018). This demonstrates that infants with hearing loss attend in the same way to language as infants without hearing loss; this is important for adults to understand so that they continue to provide a language-rich environment.

## 2-2d Motor Development

One theory of motor development, called the dynamic systems theory, predicts that individual behaviors and skills of the growing infant combine and work together to create a more efficient and effective system. Reaching, grabbing, and putting an object in the mouth are put together when eating with a spoon. Each new skill is acquired by practicing, revising, and combining earlier accomplishments to fit a new goal. Consequently, infants typically achieve motor milestones around the same time but in unique ways.

Physical development occurs in a predictable order, starting from the head and chest and moving to the trunk and lower extremities. This directional growth is readily observable as the infant gains control of head, chest, trunk, and then legs to turn over. To crawl, the infant gains control of lower back and leg muscles; to walk, the infant gains control of neck, shoulders,

back, legs, feet, and toes. Infants develop control of their arm movements from erratic waving to accurate reaching. Hand control develops from accidentally bumping and hitting to purposefully touching. Reaching occurs first, with an open hand grip. Then the fingers develop, from reflexive pinching, grasping, and reflexive releasing to controlled opening and closing.

**gross motor control** The control of large muscles.

**fine motor control** The ability to control small muscles such as those in the fingers.

Physical development involves both large movements, or **gross motor control**, and small muscle activity, **fine motor control**. Gross motor development involves large movements through milestone achievements, such as crawling, standing, walking, and throwing. Fine motor development milestones involve smaller, more refined movements, such as grasping and pointing. Three areas of movement that develop over the first three years are (1) stability, (2) locomotion, and (3) manipulation. *Stability* refers to sitting and standing upright; *locomotion* refers to crawling, walking, and running; and *manipulation* includes reaching, grasping, releasing, and throwing.

Milestones of development are essential for teachers to know because although the progression of motor development is fairly uniform, individual children vary within and between cultures in the age at which they develop both gross and fine motor skills. Appendix A provides an overview of developmental milestones for motor skill for infants through 3 years of age. At around 6 weeks old, infants begin to hold their heads steady and erect. By 2 months, they lift their upper bodies by their arms and can roll from side to back. From 3 to 4 months, babies begin grasping palm-size objects and can roll from back to side. From 6 to 8 months, they can sit alone and begin to crawl. Between 8 and 10 months, babies pull up to stand and perhaps play patty cake. At this time they begin to stand alone, and then begin to walk. From 13 to 16 months, children can build a tower of two cubes, vigorously scribble with a large crayon, and begin to walk up stairs with help. At around 20 to 24 months, toddlers begin to jump in place and kick objects. By 26 to 30 months, children begin to climb, stand on one foot, and have some interest in toilet learning. Usually at around 36 months, the child can jump and independently use the toilet.

As this general outline indicates, motor development does support the dynamic systems theory described earlier. Children progress from one milestone behavior to the next, based on successful integration of the previous behaviors and neurological maturity resulting from environmental experiences. Children who develop within the average range do not necessarily proceed through all of the developmental milestones or move in the exact sequence because movement forward in skill development is interspersed with periods of regression (Gershkoff-Stowe & Thelen, 2004). It is hypothesized that those periods of regression occur because children are uniquely combining old and new skills together, which can result in behaviors appearing to be less developed in one context than in another (Gershkoff-Stowe & Thelen, 2004).

DAP

Moving away from dynamic systems theory momentarily, we will consider the impact of the environment on physical development. Humphrey and Olivier (2014) investigated the impact of having a teenager mentor work with a selected toddler or preschooler for 1.5 hours a week for 18 weeks on seven areas of development. They found that the young children who were paired with a mentor had significantly higher levels of physical development when compared to the control group. This research

suggests that one-on-one mentoring can positively impact the acquisition of physical skills and promote physical development.

What is the impact of specifically creating environments to support physical development? Cardon, Craemer, De Bourdeaudhuij, and Verloigne (2014) found that intervention projects with a focus on creating environments that support physical activity resulted in Belgian preschoolers engaging in more moderate to vigorous physical activity during after-school hours. When preschool and elementary schools modified their outdoor learning environments to increase play space, children's physical activity levels also increased while at school. Similarly, when partners from multiple sectors (e.g., public health, land use planning, transportation engineering, education) came together to intentionally (re) create built environments, children's physical activity increased (Politis, Mowat, & Keen, 2017). Thus, it is clear from this research that the ecology (e.g., environments) young children experience can positively impact their levels of physical activity and, in turn, their physical development.

**PHOTO 2–2** Walking is a milestone of physical development.

No matter whether a physical skill is the result of a system integration or environmental impacts, the challenge for early educators is to observe physical skills and milestones and determine where individual children fall on the general scale of motor development (Photo 2–2). By performing evaluations on a regular basis, caregivers can determine whether an area of motor development requires specific tasks and experiences to enhance development and whether there are areas in which the child shows advanced development in motor skills.

**Reading Checkpoint**

Before moving on with your reading, make sure that you can answer the following prompts about the material discussed so far.

1. You have been asked to debate the relationship between development and learning. What position will you take and why?
2. Explain how the growth of the brain demonstrates the complex interaction between nature (i.e., genetics or biology) and nurture (i.e., environmental factors).
3. Describe how being born with a physical deformity such as cleft lip/palate influences not only physical development but also social and emotional development.
4. Identify the major milestones for motor development from birth to 3 years of age, and choose two examples (not already provided) that illustrate the dynamic systems theory.

# 2-3 Patterns of Cognitive and Language Development

As mentioned in Chapter 1, the most widely applied theories of cognition are Piaget's cognitive developmental theory and Vygotsky's sociocultural theory. Later chapters detail several applications of these theories in educational settings, but major principles from each theory are discussed here before we move into language development.

## 2-3a Cognitive Development: Piaget's Theory of Reasoning

Newborns use all their senses—listening, seeing, tasting, touching, and smelling—to learn about their world. This leads young children to think differently from adults. Adults are logical thinkers; they consider facts, analyze relationships, and draw conclusions. Young children are *prelogical* thinkers; their conclusions are based on their interactions with materials and people in their environment and perhaps on an incomplete or inaccurate understanding of their experiences. For example, 2 1/2-year-old Ivan has made a tilting stack of blocks. When he places a small car on top of the blocks, the stack tumbles down. Ivan tells Mrs. Young that the car broke the blocks. Ivan has constructed his understanding based on his interactions with the materials. He does not yet understand gravity, the need to stack blocks straight up rather than at a tilt, and the impact of the car's rolling wheels. The object Ivan put on the stack just before it fell was the car; as far as Ivan is concerned, the car broke the blocks.

Jean Piaget's research contributed significantly to the knowledge of cognitive development in young children. A brilliant young scientist, Piaget began his studies as a biologist. Later, listening to children respond to questions on an intelligence test, he became intrigued by their incorrect responses and the patterns of their verbal reasoning. Combining his scientific orientation, his knowledge of biology, and his experiences with the children's incorrect response patterns, Piaget began to study children's cognitive development. Piaget's clinical observation method included close observations of his own three young children as well as many other children in his extensive subsequent research. He observed what children did and wrote narrative descriptions. Later, analyzing these detailed observations, he developed his theories of cognitive development. Piaget's (1952) approach is central to the school of cognitive theory known as **cognitive constructivism** because young children actively construct knowledge about themselves and their world. They interact with materials in their environment and construct their own understanding and meaning of the events. Each of their actions and interpretations is unique to them. Young children's thinking organizes information about their experiences so they can construct their own understanding.

Central to Piaget's theory is the belief that there are stages of cognitive development; that is, 4-month-olds are cognitively different from 24-month-olds. Piaget contended that the sequence of development is the same for all children. However, the age and rate at which it occurs differ from child to child. Children develop higher cognitive skills in a systematic manner through four stages: (1) sensorimotor, (2) preoperational,

**cognitive constructivism** Theory that describes learning as the active construction of knowledge. Humans organize information about their experiences and therefore construct understanding based on their interactions with materials and people in their environment. This is also referred to as individual constructivism.

**adaptation** A change in behavior that helps children survive in their environment; described by Piaget as a cognitive skill.

**assimilation** Piaget's way of explaining how children refine cognitive schemes to incorporate new information.

**accommodation** Piaget's process of changing or altering schemes to better fit new information or the requirements of a task.

**equilibrium** A state of homeostasis or balance that reflects how an infant's or toddler's current cognitive schemes work to explain the environment.

(3) concrete operational, and (4) formal operational. At each of these stages, similar structures of intelligence are used to learn: adaptation, organization, and schemas.

**Adaptation** is a cognitive skill that involves using schemes to have direct interaction with the environment, for example, grasping and dropping an object over and over. When faced with new information that does not fit the existing schema, a child can use either of two processes to resolve the situation. **Assimilation** involves incorporating new information into an existing schemes. **Accommodation** involves changing the schema to better fit the requirements of a task or new information. Thus, children will change or alter their strategies to fit the requirements of a task. For example, banging on a hard toy will produce a noise. Yet, when faced with a soft toy, a child finds that banging is insufficient to produce a response. Squeezing might be tried instead (Photo 2–3). When children resolve how to adapt to the new information/experience, they are considered to be in the internal state called **equilibrium**. Their current cognitive schemes work to explain their environment. However, when faced with information that is contrary to their current schemes and understanding or placed in an unfamiliar situation, they experience **disequilibrium**. This internal mental state provides a motivation for learning because the children are uncomfortable and seek to make sense of what they have observed or experienced. The movement from equilibrium to disequilibrium and back to equilibrium again is known as **equilibration**. Equilibration and children's intrinsic desire to achieve equilibrium move development toward greater complexity of thought and knowledge and results in a satisfied understanding of the world (Charlesworth, 2017).

**PHOTO 2–3** Hard rattles are good for chewing on! According to Piaget, this infant learned this through the processes of assimilation and accommodation while exploring the environment.

Another cognitive function through which schemes are changed is called organization, which takes place internally. **Organization** is a process of rearranging new patterns of actions and linking them with other patterns to form a cognitive system. For example, a baby will eventually relate the actions for sucking, dropping, and throwing with new, more complex ideas of near and far. As you can imagine, these more complex ideas are actual cognitive concepts or **schemas** used to organize the child's understanding of the world.

The schema of ball is constructed as Shane sees, touches, holds, and tastes a ball. When faced with new information, for example, when he sees the ball bounce for the first time, that does not fit into his schema of "ball-ness." He continues to construct his knowledge of ball-ness by reorganizing his schema so that now bouncing is included in ball-ness. Shane's schema of ball today is different from his schema yesterday, before he noticed a bouncing ball. Individual experiences and behavior bring about changes in schemas.

**disequilibrium** An internal mental state that motivates learning because the child is uncomfortable and seeks to make sense of what the child has observed or experienced.

**equilibration** The movement from equilibrium to disequilibrium and back to equilibrium again.

**organization** A process of rearranging new sets of information (schemes) and linking them to other established schemes, resulting in an expanded cognitive system.

**schemas** Piaget's concept to explain cognitive patterns of actions used to understand the world.

Although some of the hypotheses of Piaget's theory have come into question after newer research methods demonstrated that infants and toddlers were underestimated in their cognitive skills by Piaget (Bergin & Bergin, 2012; Newcombe, 2013), the interpretation of those results from a Piagetian perspective continues to be a controversy in the field (Bibace, 2012; Kagan, 2008). This author believes the principles and stages defined by Piaget have value for the caregiver in supporting the cognitive development of very young children. Thus, our discussion will now address the stages.

Piaget's first two stages of cognitive development involve children between birth and 3 years of age. These stages, the sensorimotor stage and the beginning of the preoperational stage, are the aspects of cognitive development relevant to an infant and toddler curriculum. The **sensorimotor stage** starts at birth, when the baby explores self and the environment. Sensorimotor development involves the infant understanding their body and how it relates to other things in the environment (Piaget & Inhelder, 1969). Yet, how infants explore objects and, therefore, think, changes over time.

**sensorimotor stage** Piaget's first stage of cognitive development, which is focused on motor activity and coordination of movements.

A longitudinal study videotaped mother-infant interactions four times between 4 months and 12 months of age to investigate object exploration. They found that, at 4 months, infants focused all of their sensory modalities on objects introduced by the mother (de Barbaro, Johnson, & Deák, 2013). Later, between 6 and 12 months, infants began to separate their sensorimotor exploration so that their eyes and hands were doing different things. For example, infants may hold a toy in one hand, explore it with the other, and look at family members at the same time. This outcome is called triadic attention (baby, family member, and object). Triadic attention allows for increased conversation and interaction around the object. Previous researchers had concluded that triadic attention is a novel social-cognitive function that emerges around 12 months (see de Barbaro et al., 2013, for a review). However, this study clearly demonstrated that actions in each session built on those observed in earlier sessions. The authors concluded that triadic attention is based on "continuous changes in the activity of our participants rather than a simple shift in internal structures" (de Barbaro et al., 2013, p. 246). In other words, slowly, over time, increased infant skills elicited new behaviors from the mother, which provided novel opportunities for triadic attention.

Recent research demonstrated that when infants make errors in reaching for an object, the pathway for that reaching is remembered resulting in future errors (Dineva & Schöner, 2018). This means that in sensorimotor learning errors become part of the learning process and can impact the speed of decision making. These two studies demonstrate that the earliest form of thinking occurs during the sensorimotor stage. Three key aspects of development occur during this early stage: (1) infants play an assertive role in their own development, (2) their knowledge base is acquired by means of their own actions in the environment, and (3) infants need moderate challenges provided by adults and materials to master the environment. For caregivers, tasks should be provided that challenge babies to new actions.

## Sensorimotor Stage

The sensorimotor stage of cognitive development occurs from birth to about age 2. Piaget identified six substages.

| | |
|---|---|
| **Substage 1** (birth to approximately 1 month) | **Reflex**<br>Reflex actions become more organized.<br>Directed behavior emerges. |
| **Substage 2** (approximately 1–4 months) | **Differentiation**<br>Repeats own actions.<br>Begins to coordinate actions, such as hearing and looking. |
| **Substage 3** (approximately 4–8 months) | **Reproduction**<br>Intentionally repeats interesting actions. |
| **Substage 4** (approximately 8–12 months) | **Coordination**<br>Intentionally acts as a means to an end.<br>Develops concept of object permanence (an object exists even when the infant cannot see it). |
| **Substage 5** (approximately 12–18 months) | **Experimentation**<br>Experiments through trial and error.<br>Searches for new experiences. |
| **Substage 6** (approximately 18–24 months) | **Representation**<br>Carries out mental trial and error.<br>Develops symbols. |

## Preoperational Stage

The early part of the preoperational stage is called the preconceptual substage and occurs from about 2 to 4 years of age. At this time, the child can now mentally sort events and objects. With the development of object permanence, the child is moving toward representing objects and actions in their thinking without having to have actual sensorimotor experiences. Development and structuring of these mental representations is the task undertaken during the preoperational stage of cognitive development. Cowan (1978) outlined the preoperational stage as follows:

**Preconceptual substage**
- Mentally sorts objects and actions.
- Mental symbols are partly detached from experience.

**Nonverbal classification**
- Organizes objects graphically.
- Focuses on figurative properties.
- Forms own interpretations.

**Verbal preconcepts**
- Meanings of words fluctuate and are not always the same for the child.
- Meanings of words are private, based on own experience.
- Word names and labels are tied to one class.
- Words focus on one attribute at a time.