CENGAGE

9th Edition

Developmental Profiles

Pre-Birth Through Adolescence

Lynn Marotz

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Developmental Profiles | Pre-Birth Through Adolescence

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Developmental Profiles: Pre-Birth Through Adolescence, **Ninth Edition**
Lynn R. Marotz

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Contents in Brief

Contents

3 • Prenatal Development 50


KonstantinChristian/Shutterstock.com

4 • Infancy: Birth to Twelve Months 74


iStock.com/FatCamera

5 • Toddlerhood: One- and Two-Year-Olds 112


iStock.com/stock_colors

6 • Early Childhood: Three-, Four-, and Five-Year-Olds 137

BrickRedBard/68 images/Pixabay

7 • Early Childhood: Six-, Seven-, and Eight-Year-Olds 169

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Preface

Architectural engineers know that a structurally sound building requires a strong foundation. Similarly, early childhood educators understand that children require a strong foundation if they are to develop to their fullest potential. The quality of children's environments, early learning opportunities, and adult support and encouragement play an influential role in shaping the groundwork upon which all future skill acquisition is built. When adults understand children's developmental needs, talents, and limitations, they are able to provide effective behavioral guidance and learning experiences that ultimately create a strong foundation.

Developmental Profiles: Pre-birth Through Adolescence is designed to be a concise and accessible resource for students, educators, service providers, and families. The ninth edition has been thoroughly revised and updated, yet it maintains the author's original purpose to provide a comprehensive yet nontechnical, easy-to-follow critical overview of children's development. It links contemporary empirical research, theory, and application to the guidance of children's behavior and the promotion of developmentally appropriate learning experiences.

Purpose and Philosophical Approach

The common practice of dividing infancy and childhood into age-related units of months and years may initially appear to distort the realities of human development. However, when describing developmental expectations, developmental progress, and exceptionalities, other systems seem to work even less well. Let it be stressed here, as it is again and again throughout the text, that *age specifications are only approximate markers derived from averages or norms*. In a way, they can be thought of as midpoints that are not intended to represent any one particular child. Rather, age expectations represent summary terms for skills that vary from child to child in form and time of acquisition. The truly important consideration in assessing a child's development is *sequence*. The essential question is not chronological age, but whether the child is progressing step by step in each developmental area. *Developmental Profiles* has long proven itself to be an invaluable resource in addressing this issue.

As in the previous editions, the early days, weeks, and months of infancy are examined in detail. New research findings on brain and early development clearly support the critical importance of this relatively short time span. What is now known about infants' capacity for learning is indeed amazing and counter to long-held assumptions that they are incapable of doing so until much later. Far from it!

The first year of life is essential for building a foundation of learning in every developmental domain. The vast array of new and complex behaviors that toddlers and preschoolers must learn in three or four short years is also monumental. At no other period in a person's lifetime will so much be expected in so short a time. Given that more infants and young children are enrolled in early childhood programs makes it essential that educators and service providers have a comprehensive understanding of how they grow, develop, and learn.

Respecting and working collaboratively with children's families remains a fundamental and underlying philosophy of *Developmental Profiles*. No matter how many hours children spend with caregivers or teachers in school each day, families still play the most significant and influential role in their lives. Families must be supported in their parenting efforts. They also must be encouraged to share their observations and concerns with teachers as this information is integral to each child's development and well-being. In turn, teachers and service providers must listen to families with focused and unbiased attention and respond with genuine interest and respect.

Partnerships with families become even more critical when an infant or older child is suspected of having a developmental disorder or delay. The *Developmental Alerts* identified for each age group can be especially useful to families, educators, and service providers for initiating a discussion about their concerns. Let it be emphasized, however, that under no circumstances should this book or any other book be considered an instrument for diagnosing a developmental problem. That is the role of professional clinicians and child development specialists.

Thus, the stated purposes of this text can be summed up as follows:

- To provide a concise overview of developmental principles
- To provide easily accessible information about what to expect at each developmental stage
- To suggest appropriate ways for adults to encourage and support children's learning and development
- To pinpoint warning signs of a possible developmental disorder or delay
- To suggest how and where to get help
- To describe cultural and environmental diversity in terms of its impact on the developmental process
- To emphasize the value of direct observation of children in their natural settings, whether in a classroom, early childhood program, or the child's own home
- To provide adults with the knowledge to help children achieve their individual potentials, develop a positive sense of self-esteem, and feel loved and respected
- To highlight contemporary child development theory and research

The Intended Audience

Teachers—caregivers, families, and service providers—play an essential role in guiding children's development. It is through their ability to foster learning and positive mental and physical health and to identify challenges that may interfere with developmental progress that adults ultimately make a difference in children's lives. Thus, *Developmental Profiles* is designed for adults who care for and work with children of all ages, including:

- Students and preservice teachers.
- Teachers in home-based settings, early childhood centers, Early Start and Head Start programs, public and private schools, and before- and after-school programs; home visitors and consultants; and nonparental caregivers in the child's home.

- Allied health professionals and service providers in nursing, nutrition, audiology, social work, physical and occupational therapy, psychology, medicine, language and speech therapy, and counseling who provide services for children and their families.
- Families, the most important contributors to a child's development.

Organization and Key Content

Developmental Profiles opens with a brief overview of major child development theories and principles. These chapters (1 and 2) serve as a refresher of basic concepts and provide background material on age-level expectancies for the chapters that follow. Chapter 3 is devoted to maternal and paternal practices that are essential for promoting healthy fetal development. Detailed word pictures of child and adolescent development across six developmental domains, including typical daily routines, safety alerts, developmental alerts, learning activities to promote brain development, and positive behavioral guidance are described in Chapters 4 through 9. Pages include color-coded tabs with age designations for quick, easy-to-locate reference. When and where to seek help if there are concerns about a child's developmental progress are discussed in Chapter 10. Cutting-edge neuroscience research about children's brain development is also included in each chapter. Developmental checklists and additional resource material of interest to families, educators, and service providers are provided in the appendices. This format encourages vigilance in identifying delays in their earliest stage and supports adults in creating developmentally appropriate interventions and learning opportunities for children of all ages.

Developmental Profiles provides nontechnical, key information about the following:

- What to expect of infants, young children, and adolescents at each succeeding developmental stage
- The ways in which all areas of development are intertwined and mutually supportive
- The unique pathway that each child follows in a developmental process that is alike, yet different, among children of a similar age
- Sequences, not age, being the critical concept in evaluating developmental progress
- The use of developmental norms in teaching, observing, and assessing children and in designing individualized as well as group learning experiences

New and Expanded Content

The ninth edition of *Developmental Profiles* continues to bring readers important content features that support understanding and practice in an easy-to-reference format:

- **Measurable Learning Objectives,** identified at the beginning of each chapter, highlight key concepts that are important for students to know and understand. After completing the chapter, students should be able to demonstrate how they can apply their new knowledge and skills. The learning objectives are also reflected in the end-of-chapter summary and review questions.
- *New* **NAEYC Standards:** The content in each chapter has been aligned to the new **National Association for the Education of Young Children Professional Preparation Standards (NAEYC)** standards. Relevant standards are identified at the beginning of each chapter, as well as in the standards correlation chart

(inside cover), to help students make connections between what they are learning in the textbook and professional expectations. These callouts are also useful for program accreditation purposes.

- **Digital Downloads:** Downloadable and often customizable, these practical and professional resources allow students and practitioners to immediately implement and apply textbook content. The materials can be downloaded and retained for future use, enabling preservice teachers to begin building a library of practical, professional resources. Look for the **Digital Downloads** icon that identifies these items.
- *New* **TeachSource videos** feature footage from the classroom to help students relate key chapter content to real-life scenarios. Critical-thinking questions provide opportunities for in-class or online discussion and reflection.
- *New* **Spotlight on Neuroscience and Brain Development:** This feature, included in each chapter, draws attention to the latest neurocognitive research on critical issues (e.g., autism, breast-feeding, premature birth, maternal obesity, psychoactive stimulants, physical activity, early adversity) and the connections to children's brain development.
- **Did You Know?** Offers interesting facts in a marginal feature to arouse students' curiosity and interest in chapter content.
- *New* **Chapter to Practice:** Field-based exercises provide opportunities for students to apply developmental concepts learned in each chapter and to critique their experiences.
- *New* **What Do You See?** This feature is designed to reinforce students' observational skills by asking them to respond to what they see in a photograph.
- *New and expanded* **research on contemporary topics:** Additional material on brain development, attachment, cultural awareness and sensitivity, gender identity and sexual orientation, dual-language learners, observational skills, and strategies for supporting children's transitions has been incorporated throughout the book. Updated references reflect the latest empirical research on these subjects.
- **Concise developmental profiles:** Highlight children's sequential progress across six developmental domains, from prebirth to age nineteen in a bulleted format.
- *New* **Case Studies:** Presented at the onset of each chapter, the new case studies reflect the ethnic and family diversity experienced in today's schools. They set the stage for the chapter content that follows and are designed to help students relate what they learn to real-life situations. The **Case Study Connections** feature located at the end of each chapter includes questions that require students to reflect on and apply what they have learned.
- **Developmental Alerts** are highlighted at each age level to aid in the early identification of potential delays and/or developmental disorders that warrant further evaluation.
- **Daily Activities and Routines** typical at each age level are offered in each chapter to help families and teachers anticipate and respond appropriately to children's developmental interests and needs.
- **Positive Behavior Guidance sections** outline effective strategies for responding to children's behavior in a constructive manner to promote healthy social and emotional competence.
- **Learning Activities to Promote Brain Development** are available in digital format for easy downloading. These sections offer suggestions for developmentally appropriate learning experiences that can be used to promote children's curiosity, creativity, problem-solving abilities, and skill acquisition across all domains.

- *New* **Safety Alerts** reflect current safety concerns associated with each developmental stage and are designed to help adults create safe environments, maintain quality supervision, and support children's safety education.
- **Digital Download Developmental Checklists** are provided for each age group in Appendix A. The checklists are also available in digital format and can be downloaded for teachers, service providers, and families to use in monitoring children's developmental progress.
- *New* **Screening and Assessment Instruments:** An updated sampling of screening tests commonly used to evaluate infants', young children's, and adolescents' development are identified and described in an annotated listing (Appendix B).
- *New* **Resources:** An overview of early intervention, information, and technical assistance resources is provided in Appendix C. New online resource sites are also included at the end of each chapter.

New to This Edition

Each chapter has been updated in many ways. New photos, figures, content, research, and professional standards have been incorporated throughout the book. Some of the most significant changes include:

Chapter 1: *Child Development Theories and Data Gathering*. This chapter features new content aligned with the current NAEYC professional preparation standards. Information regarding e-portfolios and assessment has been expanded. The conduct of brain research and current findings are the topic of the *Spotlight on Neuroscience and Brain Development* feature.

Chapter 2: *Principles of Growth and Development*. This chapter features several new and expanded sections on attachment, socio-ecological factors and developmental risk, gender awareness and sexual identity, and eye gaze and its relationship to children's language development. New research has been added on exposure to adversity and its negative effects on children's brain development. New photos, research, and TeachSource videos are also provided in this chapter.

Chapter 3: *Prenatal Development*. Statistics, graphics, and photos have been updated in this chapter. New information on autism and paternal health, reproductive technologies, fetal development and maternal obesity, low birth weight infants and developmental outcomes, conditions that influence fetal development, and postpartum depression have been added.

Chapter 4: *Infancy: Birth to Twelve Months*. This chapter includes a new case study focused on family diversity, updated safety guidelines, new research findings, and information on social eye gaze and autism. A new *Spotlight on Neuroscience and Brain Development* addresses breast milk composition and its beneficial effects on infant brain development.

Chapter 5: *Toddlerhood: One- and Two-Year-Olds*. New research that adds to our understanding of children's language development, gender concept, media use, and cultural expectations is discussed. Safety guidelines have also been updated. A new *Spotlight on Neuroscience and Brain Development* examines the influence of music and participation in musical activities on the developing brain.

Chapter 6: *Early Childhood: Three-, Four-, and Five-Year-Olds*. This chapter includes new and expanded information on childhood fears and nightmares, reasoning and moral development (Theory of the Mind), gender and culture, friendships, and research on the origins of autism.

Chapter 7: *Early Childhood: Six-, Seven-, and Eight-Year-Olds*. New research on play-based learning, friendships, social-emotional development, and the effect of sleep on children's brain development and functioning have been added to this chapter.

Chapter 8: *Middle Childhood: Nine-, Ten-, Eleven-, and Twelve-Year-Olds*. Additional information and empirical research findings that address puberty, social-emotional development, safety concerns, and the impact of physical activity on neurocognitive functioning are included in this chapter.

Chapter 9: *Adolescence: Thirteen- to Nineteen-Year-Olds*. New content and research regarding culture and adolescent behavior, depression and suicide, and social-emotional development during adolescence have been added to this chapter. New research on psychoactive stimulants (e.g., cannabis, alcohol) and their effect on adolescent brain development and functioning is discussed in the *Spotlight on Neuroscience and Brain Development* feature.

Chapter 10: *When and Where to Seek Help*. New to this chapter are legislative updates, research on premature birth and neurocognitive development, and a video feature that discusses children with exceptionalities in inclusive classrooms.

Accompanying Teaching and Learning Resources

Online Instructor's Manual

An online Instructor's Manual accompanies this book. It contains information to assist instructors in designing their course, including discussion questions, teaching and learning activities, field experiences, learning objectives, and additional online resources. Additional online resources and assessments include:

- TeachSource videos of teachers teaching and children learning in real classrooms, accompanied by case study questions to assess students' understanding of the video concepts. All TeachSource videos can be found in the Cengage eBook for *Developmental Profiles*.
- Case scenarios requiring students to analyze typical teaching and learning situations and create a reasoned response to the issue(s) presented in the scenario, reflecting about and justifying the choices they made within the teaching scenario problem.
- Digital Download resources

PowerPoint® Lecture Slides

These vibrant Microsoft® PowerPoint lecture slides for each chapter assist you with your lecture by providing concept coverage using images, figures, and tables directly from the textbook!

Cengage Learning Testing 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 LMS, your classroom, or wherever you want.

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Finally, I am grateful for my family's continued understanding and support….they mean the world to me!

ABOUT THE AUTHOR

Lynn R. Marotz, Ph.D., R.N., taught undergraduate and graduate courses in the Department of Applied Behavioral Science, University of Kansas, and served as the Associate Director of the Edna A. Hill Child Development Center for over 35 years. She worked closely with students in the early childhood teacher education program and offered courses in parenting, health/safety/nutrition for the young child, administration, and foundations of early childhood education.

Lynn has authored invited chapters on children's health and development, nutrition, and environmental safety in national and international publications and law books. She is also the author of *Health, Safety, and Nutrition for the Young Child, Parenting Today's Children: A Developmental Perspective, Early Childhood Leadership: Motivation, Inspiration, Empowerment,* and *By the Ages: Behavior & Development of Children Pre-birth Through Eight*. Her involvement in state policy development, health screenings, professional development training, working with families and allied health professionals, and the referral process is extensive. She has presented at international, national, and state conferences, and held appointments on national, state, and local committees and initiatives that advocate on children's and families' behalf. However, it is her daily interactions with children and their families, students, colleagues, and her beloved family that bring true insight, meaning, and balance to the material in this book.


Anna Shvets/Pexels

Chapter 1

Child Development Theories and Data Gathering

Learning Objectives

After reading this chapter, you will be able to:

- **1-1** Compare and contrast the fundamental contemporary child development theories described in this chapter.
- **1-2** Explain why authentic assessment is the most developmentally appropriate method for evaluating children's progress.
- **1-3** Describe five methods that can be used for gathering observational data about children.

NAEYC NAEYC Professional Standards Linked to Chapter Content

1a and 1b: Child development and learning in context

2a: Family–teacher partnerships and community connections

3a, b, and c: Child observations, documentation, and assessment

Shortly after Tucker celebrated his first birthday, social workers removed him from his nineteen-year-old mother's home because of malnourishment and severe neglect. He was placed temporarily with an older couple who had long served as foster parents for many children. Several weeks after Tucker's initial placement, he was moved again to a different foster home where there were other children closer to his age. However, soon after Tucker arrived, the family decided that they no longer wanted to remain foster parents. This necessitated moving him yet again, and several additional times thereafter.

Tucker recently celebrated his fifth birthday and has been living with his current foster parents, Serena and James Martinez, for almost a year. They have two little girls of their own, ages four and six, and three additional foster children ranging in age from four to nine years. All the children are vigorous and outgoing except for Tucker, who seems to tire easily and is quite small for his age. Serena discussed her concerns with Tucker's pediatrician during his recent well-child checkup. When the nurse weighed and measured Tucker,

he was only in the 30th percentile for height and weight, despite the fact that Serena says he eats far more than the other children.

Serena and James learned from their social worker that Tucker sat up, crawled, and eventually began to walk much later than most children his age. He continues to experience some motor delays, but is working with a therapist who believes that he is making good progress. Serena and James also have noted that Tucker seldom joins in play or conversation with the other children. However, they have occasionally overheard him holding lengthy and comprehensible discussions with his imaginary friend, Honey, at times when he thinks he is alone. The talk is usually about things he fears, possibly the root of recurring bad dreams from which he often wakes up screaming. Yet, despite his problems, Tucker is a kind and lovable child. He seizes any opportunity to curl up on Serena's lap, suck his thumb, and snuggle his free hand into hers. The Martinezes have come to love Tucker as one of their own and are currently in the process of formalizing his adoption.

Ask Yourself

- What aspects of Tucker's development pose a concern?
- In what ways are Serena and James attempting to meet Tucker's fundamental needs?

Children's development has interested philosophers and psychologists for decades (Figure 1-1). Early attempts to explain the origin of children's ideas and the processes involved in learning were derived primarily from personal observations and interpretations. Theories built solely on this information were later found to be incomplete, inconsistent, and vastly divergent in their explanations. The introduction of formalized scientific methodologies during the twentieth century enabled child development researchers to produce data that was more comprehensive, consistent,

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Figure 1-1 Children's development has been the subject of study for many decades.

and reliable. Although many earlier theories were abandoned, significant differences of opinion regarding how children learned persisted among child development researchers.

It is unlikely that any one theory could ever adequately explain the complexities of human behavior. Each has contributed in some way to our understanding of children's development and reminds us that behavior is a product of multiple and complex factors. It is also important to remember that theories reflect the prevailing beliefs and conditions (e.g., social, economic, religious, and political) at a given historical point. As a result, existing children's development theories are often revisited and refined and are likely to continue changing over time.

Contemporary Theories

A longstanding debate in the child development field has centered on whether learning is the result of heredity (innate abilities) or environment (experiences). This argument is commonly referred to as the **nature vs. nurture** controversy (Honeycutt, 2019). Early philosophers, including Plato and Aristotle, believed that all behavior was biologically predetermined (nature). In other words, it was thought that children were born hardwired to think and act in specific ways. This conclusion was derived from the fact that most children learn to walk, talk, and feed themselves when they reach certain specific ages. By contrast, John Locke and other philosophers suggested that children were born with blank minds (*tabula rasa*, or clean slate) and that all behavior is learned and a product of one's environment and experiences (nurture).

Scientific advancements subsequently have criticized both theories for explaining human behavior in overly simplistic terms. Brain imaging studies, for example, have confirmed that development is not an either/or process. Rather, researchers have demonstrated that learning causes physical changes in the brain's structure and function. These changes are the product of complex interactions that occur between genetic materials (such as brain cells and an intact neurological system) and learning opportunities in the child's environment.

Much of our current knowledge about how children learn, grow, and mature is derived from several classical theories: maturational, psychoanalytic and psychosocial, cognitive-developmental, behaviorism and social learning, bioecological, and essential needs. An overview of the fundamental constructs associated with each theory follows.

Maturational Theory

Maturational theory focuses on a biological or *nature* approach to human development. All behavior is explained in terms of genetics and the biological changes that must occur before a child is able to perform certain skills; this capacity is often referred to as a stage of *biological readiness*. For example, maturational theory would argue that infants learn to walk only when their neurological system has matured sufficiently to permit this activity, regardless of any other factors, including opportunity or environment.

Arnold Gesell's historic research contributed significantly to our understanding of genetic influences on children's development. He believed that all development is governed primarily by internal forces of biologic and genetic origin (Dalton, 2005; Gesell & Ilg, 1949). This led to several notable publications in which he described children's achievements by age and explained them in ways that parents could understand and put into practice.

Few scientists would disagree that genetics play a critical role in human development and, in some cases, even has a limiting effect. For example, the genes that children inherit from their biological parents determine height, skin color, shoe size, hair color,

nature vs. nurture Refers to whether development is primarily due to biological– genetic forces (heredity– nature) or to external forces (environment–nurture).

What Do You See?

Development as a biological manifestation. Every child differs in terms of genetic makeup and daily experiences. How would Arnold Gesell explain any differences in the way these two children perform on this counting task?

and other distinguishing features. Genes are also responsible for chromosomal abnormalities, such as those causing Down syndrome, congenital deafness, vision defects, and a host of other limiting disorders. Neuroscientists have also identified biological differences associated with various personality traits (e.g., shyness, aggressiveness, agreeableness) as well as predispositions to certain mental health disorders (Montag et al., 2020; Poole et al., 2019).

Although most experts acknowledge that genetics are important to human development, they also do not accept it as the sole cause of behavior. Most experts believe that the maturational theory overlooks individual differences and the ways in which they influence learning experiences and outcomes. Yet it is interesting that some current educational practices, such as admission standards based on birth dates and "redshirting" (holding back) a child whose birthday falls close to a predetermined cutoff date, continue to accept a maturational position.

Gesell's contributions continue to serve a functional purpose despite some of this criticism. His observations have been translated into **norms**, or benchmarks that have proven useful for assessing and monitoring children's developmental progress. More recently, they have been incorporated into several commonly used screening tools, including the Ages and Stages, Denver Developmental Screening Test, and the Bayley Scales of Infant and Toddler Development. Scientists continue to update Gesell's original standards so that they more accurately reflect today's diverse population.

norms Age-level expectancies associated with the achievement of specific developmental skills.

Psychoanalytic and Psychosocial Theory

Psychoanalytic and psychosocial theory postulates that much of human behavior is governed by unconscious processes, some of which are present at birth and others that develop over time. Sigmund Freud, considered the originator of psychoanalytic theory, believed that children's behavior is a reflection of their inner thoughts and sexual desires (Freud, 1923). He proposed a series of stages (e.g., oral, anal, phallic, latency, and genital) and suggested that children must resolve and satisfy certain emotional conflicts fully before they can advance to the next developmental phase. The degree to which these emotions are or are not fulfilled ultimately shapes the child's basic personality, which Freud believed was established during the first five years of life.

Psychosocial theory is based on the work of Erik Erikson, who expanded on Freud's ideas about personality development. He, too, believed that each developmental stage is characterized by certain conflicts that must be resolved. After a successful resolution has been achieved, a person is motivated to undertake the next developmental challenge.

However, unlike Freud, Erikson's theory acknowledges the influence of environment and social interactions. He coined the term *ego identity* to describe an individual's conscious awareness of self (who I am in relation to others) and the lifelong changes that occur as a result of social interactions. Erikson was also the first to describe development across the life span by introducing his eight universal stages of human development (Erikson, 1950). The first four stages address the early years; the remaining four cover the span from adolescence to the later years:

- **Trust vs. mistrust (0–12 months)** Establishing a sense of trust with primary caregivers
- **Autonomy vs. shame and doubt (1–3 years)** Learning to gain control over some behaviors (e.g., eating, toileting, and sleeping) and developing a sense of autonomy or independence
- **Initiative vs. guilt (3–5 years)** Using social interaction to gain control over one's everyday world
- **Industry vs. inferiority (6–12 years)** Developing a sense of competence and pride through successful accomplishments
- **Identity vs. confusion (13–20 years)** Learning about self in relationship to others
- **Intimacy vs. isolation (20–35 years)** Exploring and forming intimate relationships
- **Generativity vs. stagnation (35–55 years)** Focusing on family, career, and ways of contributing to society
- **Integrity vs. despair (60s–death)** Reflecting on one's life and forming a sense of satisfaction or dissatisfaction

Psychoanalytic and psychosocial theories have contributed to our understanding of personality and social-emotional skills and their influence on all aspects of children's development. They also have helped us to better understand the universal challenges that children face at each stage and how to create environments that support children's social and emotional needs along a developmental continuum. However, critics suggest that the social expectations associated with various stages are too generic and may lack relevancy for all cultures.

Psychoanalytic and psychosocial theories are no longer as popular as they once were. However, they continue to foster research interests in areas such as caregiver consistency, attachment, morality, gifted education, play, cultural similarities and differences, and trauma's effects on children's development.

Did You Know ?

.....Freud was the oldest of eight children and considered himself to be his mother's favorite, "darling Siggie"?

Cognitive-Developmental Theory

Jean Piaget was the first psychologist to study the qualitative and maturational changes that occur in children's cognitive development. He theorized that children were born with basic genetic capabilities that enabled them to construct knowledge and meaning through active exploration of their environment (Figure 1-2). The term **constructivism** often is used today to describe this mode of learning.

According to Piaget, children progress through four distinct stages of intellectual development, beginning in infancy and continuing into the late teens (Piaget, 1954):

- **Sensorimotor (birth–2 years)** The infant's reflexive behaviors gradually give way to intentional actions during the sensorimotor period. Young children explore and discover the world around themselves primarily through their senses.

constructivism A learning approach in which individuals form their own meaning through active participation.

Jennifer Murray/Pexels

Figure 1-2 Jean Piaget believed that children learn through exploration and discovery.

They also begin to learn that they have the power to control some elements in their environment. For example, a toddler sees an object, picks it up, examines it while turning it around in his hands, and finally puts it into his mouth.

- **Preoperational (2–7 years)** Children begin thinking about things in their immediate environment in terms of symbols. For example, the three-year-old picks up a long stick, calls it a fishing pole, and pretends to catch a fish. This example also illustrates a second aspect of the preoperational stage (the emergence of language), which is another form of symbolic representation.
- **Concrete operational (7–11 years)** During this stage, children are developing the ability to comprehend and formulate ideas about their immediate world. Although their ideas remain quite simplistic and rigid, children are beginning to think logically, to anticipate outcomes, to classify objects, and to solve problems. These emerging *schema* (Piaget's term) lead to a rudimentary understanding of abstract concepts, such as those associated with math and spatial relationships.
- **Formal operational (11–15 years)** During this stage, children are able to use complex thinking skills to visualize and manipulate ideas and experiences in their heads without having immediate access to real or concrete objects (abstract thinking). In addition, they are able to think logically, weigh consequences, and use memory for problem solving.

Piaget alleged that children's cognitive development involves far more than the passive accumulation of new information. He described cognition as an active process defined by increasingly sophisticated thought processes that emerge as children transition from one developmental stage to the next. Piaget introduced several terms to describe these changes:

- *Schemas*—Mental patterns or categories (e.g., food, objects, places, or animals) that a child begins to form and use for organizing and storing information.
- *Assimilation*—The process of incorporating new information into preexisting schemas. For example, a carrot is food, and a rabbit is an animal.
- *Accommodation*—The process of modifying preconceived schemas or forming additional schemas based on new information. For example, a carrot is a vegetable, and a rabbit is a mammal.

- *Disequilibrium*—The period of confusion, conflict, tension, or all three that results when new information does not fit within existing schemas.
- *Equilibrium*—The process of using assimilation and accommodation to alleviate intellectual conflict.

Although experts have criticized some of Piaget's ideas, his contributions continue to influence contemporary educational practices, including discovery learning, the importance of play, peer teaching, and developmentally appropriate curriculum.

Lev Vygotsky (1986) also was interested in children's cognitive development, but he considered the processes involved in its formation to be different from those proposed by Piaget. He agreed with Piaget's notion that development follows a unique pattern and that children learn through active involvement and hands-on experiences. However, Vygotsky felt strongly that social and cultural environments (e.g., values, beliefs, and practices) shaped and ultimately determined the nature of children's learning. He believed that culture provided the mental framework for all thoughts and behavior, while language served as the mechanism for transmitting this information from one individual to another. For example, he explained that children initially learn how to behave in a certain way through a series of adult directives: "Don't touch," "Come here," "Eat this," "Stop that." As children begin to internalize social rules and cultural expectations and develop self-control, the nature of these directives gradually changes. Adults stop telling children what to do and shift their attention to encouraging and assisting the acquisition of new skills. Vygotsky referred to this as the **Zone of Proximal Development**.

Vygotsky also considered children's speech and language development a critical step in the socialization process. He believed that young children spend considerable time learning new words, thinking about their meanings, making associations, and forming an understanding about how they are to be used. Vygotsky observed that during this process, some children hold conversations with themselves as a way of thinking out loud. He referred to this stage as "self-talk," or inner speech, and suggested that the process provides children an opportunity to rehearse the meanings of words and how they function as communication tools before actually using them in social situations (Vygotsky, 1986).

Marie Montessori's ideas also have contributed to our understanding of cognitive-developmental theory. Trained as a pediatrician, she later became interested in educating children who were considered not capable of learning. She was convinced that all children had potential, but that traditional instructional methods might not always be effective. Her observations led to her belief that children learned best through a process of self-directed exploration. She designed a collection of sensory-based, self-correcting materials that required limited adult intervention. She also developed educational programs based on a philosophy that emphasized and encouraged children's natural curiosity and self-directed involvement in learning experiences.

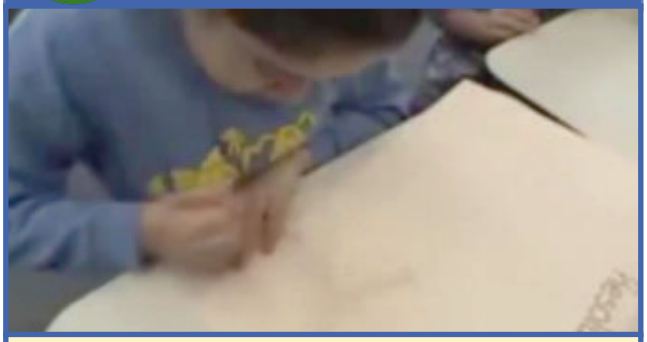
Cognitive-developmental theorists have advanced our understanding of how children learn and construct meaning. They have raised educational awareness about differences in children's rate and style of learning and the importance of individualizing instruction to address each child's unique developmental needs. Their ideas have influenced policy formation and are evident in the position statement of the National Association for the Education of Young Children (NAEYC) on developmentally appropriate practice (DAP), as well as the philosophies of other educational organizations (NAEYC, 2020). For example, the concept and delivery of early intervention services is built on a foundation of cognitive theory. Children's cognitive development also continues to serve as a source of scientific study, particularly as it relates to curriculum, instructional methods, family involvement, social interaction, and the effects of cultural influence on children's development.

Did You Know ?

.....that Vygotsky was considered a genius of his time and often was referred to as the "Mozart of psychology"?

Zone of Proximal Development Vygotsky's term for tasks that initially prove too difficult for children to master by themselves but that they can perform with adult guidance or assistance.

TeachSource Video Connections



Zone of Proximal Development

Adults intuitively use a variety of instructional methods to help children learn a new skill until they are able to perform it independently. Respond to the following questions after you have watched the learning video *5-11 Years: Lev Vygotsky, the Zone of Proximal Development and Scaffolding:*

1. What is the Zone of Proximal Development?
2. What role do adults play in this process?
3. What is scaffolding? How did the teacher illustrate this instructional concept in the video?

Behaviorism and Social Learning Theory

In its modern form, behaviorism and social learning theory stem from the works of B. F. Skinner and John B. Watson, who formulated a *nurture,* or environmental, approach to learning (Skinner, 1938). They argued that development, for the most part, involves a series of learned behaviors based on an individual's positive and negative interactions with the environment (Figure 1-3). For example, they would suggest that reinforcing a behavior typically causes it to be repeated. In other words, telling a child that he should be proud of the score on his spelling test is likely to motivate him to study even harder for the next one. However, the opposite is also true: giving in to a crying child's demands for a much-wanted toy may encourage her to repeat the behavior the next time she wants something. Ignoring the child's demands tends to reduce and eventually extinguish the behavior because there is no reinforcement (attention).

Skinner also explained how the association between two events (stimulus-response) results in learning. For example, a toddler bumps her head (stimulus) when she stands up under the table, so she abruptly ends the activity (response). A preschooler touches a hot pan (stimulus) and is careful to avoid repeating the same behavior (response). You promise to read a favorite book to your daughter (stimulus) if she picks up her toys (response), and she does so quickly.

Albert Bandura modified several of Skinner's earlier ideas when he formulated his own theory of social learning (Bandura, 1977). He viewed behavior as a combination of environmental influences (nature) and cognitive abilities (nurture). He also believed that children learned both positive and negative behaviors through observation and modeling (imitation). However, unlike Skinner, he did not agree that reinforcement was necessary

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Figure 1-3 Social learning theory explains development as behavioral changes that result from observation and imitation.

to motivate or change behavior. He believed that children learned, for example, not to hit another child or not to take away a toy after having observed another child being punished for the same act.

Families and teachers employ the behavioral theory principles on a daily basis. They expect children to comply with requests and then reward or punish them accordingly. They model behavior that children are likely to imitate. They provide attention and encouragement, thus reinforcing the children's efforts (good or bad). Behavioral interventions also are commonly used in the treatment of behavior and developmental problems, such as aggression, feeding disorders, anger management, substance abuse, bullying, and obesity (Evans, Blossom, & Fite, 2020; Wood et al., 2020).

Bioecological Theory

There is little dispute among child development experts that environment has an influential effect on development. However, Urie Bronfenbrenner, a noted American scholar and psychologist, alleged that environment played a pivotal role in this process, especially during a child's early years. He proposed his ecological model of human development based upon this conviction and described environment from a multilayered, subsystem perspective: microsystems (e.g., face-to-face interactions with primary caregivers, siblings, and friends); mesosystems (e.g., school-home linkages and interactions with relatives); exosystems (e.g., mass media, parent's workplace, and social services); macrosystems (e.g., cultural values and customs, ethnicity, economic conditions, and politics); and chronosystems (e.g., changes that occur over time, such as moving to a new location, birth of a sibling, divorce, or a military deployment) (Bronfenbrenner, 1979) (Figure 1-4). Bronfenbrenner suggested that development is a product of the reciprocal interactions and relationships that an individual experiences across and within each of

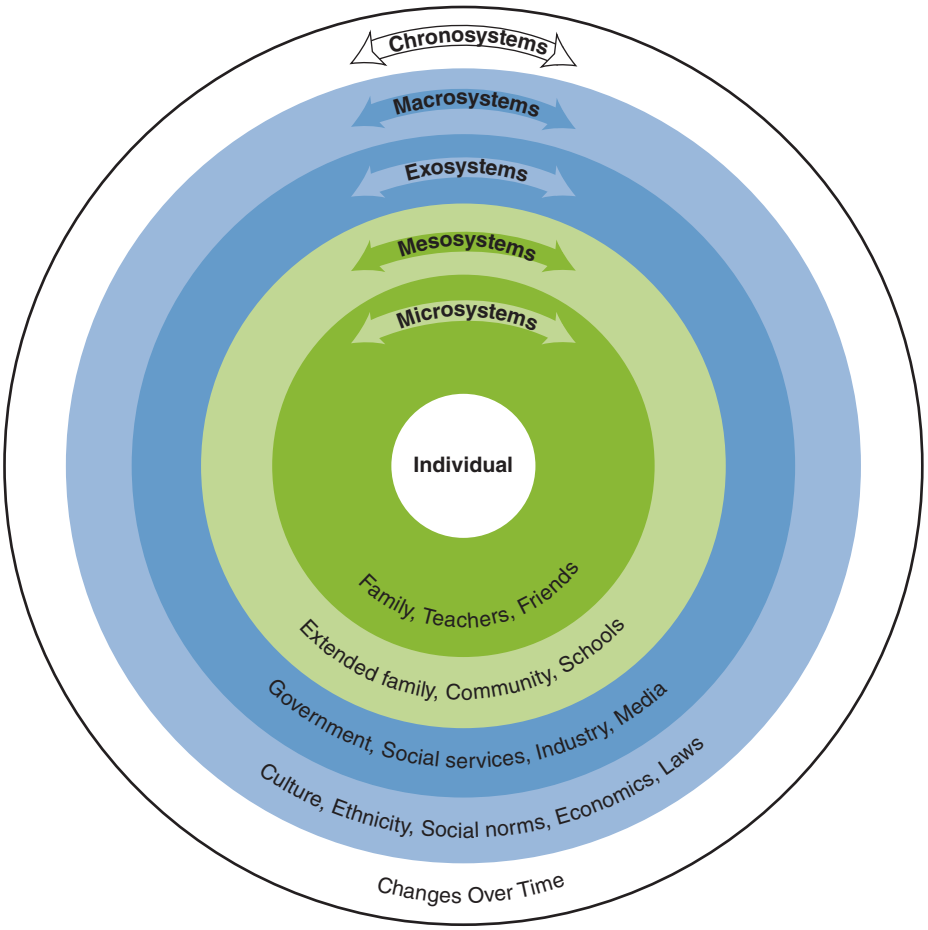

Figure 1-4 Bronfenbrenner's ecological model.

these subsystems. He also believed that as a result, developmental research was more insightful and meaningful when conducted in children's natural settings.

Bronfenbrenner later modified his original ideas to acknowledge and include the influence of biological factors. His revised bioecological model offers several unique perspectives on human development. First, it defines environment as a multilayered, interactive system and discards the notion that it can be treated as a single entity. Furthermore, it recognizes behavior as a product of the multiple, complex subsystems in which an individual participates. For example, poverty by itself may not limit a child's development if access to social services, high-quality schools, and a nurturing family are in place. Conversely, a child raised in a dysfunctional middle-class family may experience significant behavioral and developmental disorders. Bronfenbrenner's revised theory also emphasized the interactive nature of environment—that not only does environment affect an individual, but the nature of that environment is continuously changing in response to a person's behavior, age, and interactions.

The bioecological theory has had a significant impact on educational practices. It raised diversity awareness, which in turn has led to the development of bias-free curricula, assessment procedures, and play materials. Teacher education programs have also responded by addressing biased perspectives, social injustice, and the need to respect and respond to individual differences. The bioecological theory has also furthered our understanding of how environment and relationships shape a child's development and why family involvement and collaboration are essential in schools.

Did You Know ?

…. that Urie Bronfenbrenner was a cofounder of the national Head Start program?

Maslow's Essential Needs Theory

Abraham Maslow, an American psychologist, attempted to describe human behavior from a motivational needs perspective (Maslow, 1968) (Figure 1-5). He believed that unmet physical and psychological needs drove an individual to take action to satisfy them. Only when one particular need was met or fulfilled would the individual be able to move on and pursue higher goals. For example, a hungry person is driven to find food; once that hunger is satisfied, the person may have the needed energy to work or to engage in a pleasurable or an educational activity. Similarly, a person who succeeds in securing an entry-level job may be motivated to seek additional training in order to perform better or to be considered for a promotion in the future. Maslow also believed that the inability to satisfy a higher

Figure 1-5 Maslow's hierarchy of essential needs.

need would cause the person to retreat temporarily to a lower and more comfortable level. For example, a child who is eager to make new friends but is rejected may withdraw temporarily until she regains her confidence and makes another attempt.

All children—those who are developing normally or typically and those who are gifted, have developmental disabilities, or are **at risk** for developing problems—have essential physiological and psychological needs in common. Only when these basic needs are met will a child be able to survive, thrive, and develop to his fullest potential.

Developmental psychologists have long considered the early years to be the most critical in the entire life span (Bruchhage et al., 2020). Their assumptions have been confirmed and documented many times over by contemporary neuroscientists. During these very early years, children learn most of the fundamental behaviors that characterize the human species—walking, talking, thinking, communicating, and socializing. Never again will the child grow as rapidly, change as dramatically, or be so totally dependent on adults to satisfy life's basic needs and opportunities for learning.

Essential needs—physical, psychological, and learning—are often separated for discussion purposes. However, it must be understood that they are mutually interrelated and interdependent. Meeting a child's physical needs while neglecting psychological needs may lead to serious developmental problems. The opposite also is true—children may experience difficulty in learning and getting along with others if they are being maltreated or their physical needs are neglected. Only when children's essential needs are being fully met will they continue to develop and become self-fulfilled, productive individuals (Jiang et al., 2020; McGuire & Jackson, 2020).

Physical Needs

- Adequate shelter and protection from harm (e.g., violence, neglect, and preventable injuries).
- Sufficient food that is nutritious and appropriate to the child's age.
- Clothing and shoes suitable to the climate and season.
- Preventive physical, mental, and dental health care that is accessible and affordable.
- Personal hygiene practices (e.g., hand-washing, brushing teeth, bathing).
- Rest and activity, in balance; opportunities for indoor and outdoor play.

Psychological Needs

- Affection and consistency: **nurturing** families and teachers who provide positive behavioral guidance.
- Safety, security, and trust: familiar surroundings with family and teachers who are dependable, protective, and responsive to the child's needs.
- **Reciprocal** exchanges that begin in earliest infancy; give-and-take interactions that convey trust, caring, and respect (Markova, Nguyen, & Hoehl, 2019).
- Appropriate adult expectations of what the child can and cannot do at each stage of development.
- Acceptance and positive attitudes shown toward the cultural, ethnic, language, or developmental differences (or all of them) that characterize the child and family.

Learning Needs

- Play opportunities that support early learning; freedom to explore and experiment within safe boundaries; limits that are stated clearly and maintained consistently (Schlesinger et al., 2020) (Figure 1-6).
- Access to **developmentally appropriate** learning experiences, environments, and play materials (McCollow & Hoffman, 2019; Taylor & Boyer, 2020).
- Opportunities that challenge and advance a child's skill development but do not lead to excessive frustration.

at risk A term describing children who may be more likely to have developmental impairments due to certain predisposing factors such as low birth weight (LBW), neglect, or maternal drug addiction.

essential needs Basic physical requirements such as food, shelter, and safety, as well as psychological needs, including love, security, and trust, which are required for survival and healthy development.

nurturing Refers to qualities of warmth, loving, caring, and attention to physical and emotional needs.

reciprocal Refers to exchanges between individuals or groups that are mutually beneficial (or hindering).

developmentally appropriate A term describing learning experiences that are individualized and based on a child's level of skills, abilities, and interests.

Robert Kneschke/Shutterstock.com

Figure 1-6 Children are continuously learning through their social interactions.

- Treatment of errors and delays in achieving a skill as important steps in the learning process, never as reasons for criticizing or ridiculing a child.
- Adults who demonstrate in their everyday lives the appropriate behaviors expected of the child, especially in language, social interactions, and ways of handling stress. Remember that adults serve as important role models for children; children learn far more from observing adults' behavior than from what they hear adults say.

Respect and Self-Esteem Needs

- A literacy-rich environment and inclusion in an active language "community" in which children can learn to communicate through sounds, gestures, signs, and, eventually, words and sentences (spoken, signed, or written).
- A supportive environment in which the child's efforts are encouraged and approved: "You picked up your crayons without being asked!"
- Acknowledgement of all accomplishments, small or large, and for errors as well as for successes: "Look at that! You put on your shirt without any help" (no mention of the button that was missed).
- Recognition that accomplishments and an "I can do it" attitude are important **intrinsic** motivators and essential components of a child's **self-esteem**: "You did a great job of pouring the juice without spilling!"
- Sincere attention drawn to what the child is doing well; using **descriptive praise** to help the child recognize and respect their own accomplishments: "You got your shoes on the right feet all by yourself!"
- Awareness of the effort and concentration that go into acquiring basic developmental skills; providing positive responses to each small step as a child works toward mastery of a complex skill, such as self-feeding with a spoon: "Good job! You took a small bite and it was easier to chew."

Only when children are healthy and have their basic or essential needs satisfied can we expect them to be ready and able to learn (Marotz, 2019). The critical nature of this relationship continues to be demonstrated in numerous research studies (Jirout et al., 2019; Loomis, 2020; Wang, Tian, & Huebner, 2019). The results have prompted support for policy and programs that assist families in meeting children's needs for nutritious food, health care (mental, physical, and oral), safe and nurturing homes, and educational opportunities that are accessible and meaningful. Examples include Head Start, school breakfast and lunch programs, Parents as Teachers, and Children's Health Insurance

intrinsic A feeling of personal satisfaction, pride, or pleasure.

self-esteem Feelings about one's self-worth.

descriptive praise Words or actions that describe to a child specifically what they are doing correctly or well.

Spotlight on **Neuroscience** and **Brain Development**

Why Conduct Brain Research? What Have We Learned?

Most of what previously was known about the brain and its role in children's development and disease was derived from observation and postmortem examinations. The introduction of noninvasive, three-dimensional computerized imaging technologies, such as positron emission tomography (PET), magnetic resonance imaging (MRI), and functional magnetic resonance imaging (fMRI), now has made it possible for scientists to study the living brain and to observe while it functions in real time. For example, Chen and colleagues (2020) and other scientists have discovered that the brain actually changes its activity pattern (plasticity) as a bilingual individual switches from one language to another.

Researchers are able to use imagining technologies to visualize an individual's brain circuitry and the way in which molecules interact to produce human behavior (Dufford, Kim, & Evans, 2020). They have also identified structural and chemical alterations that are associated with various neurodevelopmental disorders (e.g., autism, attention deficit hyperactivity disorder), neurological conditions (e.g., epilepsy, Parkinson's disease, Alzheimer's, posttraumatic stress disorder), and psychiatric disorders (e.g., depression, addiction, schizophrenia) (Edgar, 2020; Roos et al., 2020).

Neuroimaging studies continue to yield unprecedented findings that are rapidly advancing our understanding of how the brain's activity relates to learning and behavior. For example, normative changes are known to occur in the brain's electrical circuitry and cortical layers during adolescence. These alterations have been linked to a decrease in emotional awareness and impulse control which, in turn, increase an adolescent's risk for addiction (Fox, Karim, & Syed, 2020; Tervo-Clemmens et al., 2020). Abnormal changes in the brain's structural components have also been identified in children who are subjected to maltreatment, violence, and other environmental traumas (Killion & Weyandt, 2020; van Rooij et al., 2020). Neuroscientists have confirmed that these alterations influence children's individual learning rates and styles. They have also found that some instructional methods are more effective for teaching certain subjects, such as second languages, reading skills, and mathematical computation (Wilkey, Pollack, & Price, 2020).

These are but a sampling of the brain research discoveries that continue to improve our understanding of children's development and how best to support it. They also have had a significant impact on practices and policy decisions throughout the education, health care, and social justice systems.

Program (CHIP). Educators also understand this critical connection and devote substantial time and effort to ensuring that children and their families obtain supportive resources.

Data Gathering

What we know about children—how they grow and develop, how they learn, and how they interact with others—stems from firsthand observation. For decades, psychologists and educators have observed the daily activities of hundreds of infants and young children. They recorded what they saw and heard as children learned to walk, communicate, grasp basic science and math concepts, interact with peers, reason, and solve challenging problems. Their observations provided the foundation for what we now know about child development, effective teaching practices, curriculum models, and the significance of family–child relationships.

Early childhood educators continue to recognize the importance of gathering information about children's behavior and development and using it to enhance learning. Despite increasing pressures for standardized testing, documentation, and accountability issues in schools, teachers understand the value of observing children in their **naturalistic settings** (DeLuca et al., 2019; Pool & Hampshire, 2019). This approach, referred to as **authentic assessment**, is considered the most effective and

naturalistic settings Environments that are familiar and part of children's everyday experiences, such as classrooms, care arrangements, and the home.

authentic assessment A process of collecting and documenting information about children's developmental progress; data is gathered in children's naturalistic settings and from multiple sources.

TeachSource Video Connections

Culturally Responsive Teaching

Children's development is shaped by an array of genetic and environmental factors. Acknowledging cultural differences is essential to recognizing and accepting children as unique individuals. Respond to the following questions after you have watched the learning video *Culturally Responsive Teaching: A Multicultural Lesson for Elementary Students*:

1. How would Urie Bronfenbrenner describe multiculturalism and its effect on children's learning?
2. Why do you think diversity should be addressed in the classroom?
3. In what ways are children more alike than different? Why is it important to remember that fact?

appropriate method for evaluating and supporting young children's development and learning (Mangione, Osborne, & Mendenhall, 2019).

Authentic assessment involves gathering performance-based evidence in the context of everyday settings and activities. Samples of children's products, family input, and teacher observations are collected continuously and systematically to document learning. This information provides an ongoing, comprehensive picture of a child's developmental progress and reduces the potential bias that results when decisions are based on a single evaluation measure. Authentic assessment also contributes to teachers' understanding of children's skills, abilities, and special needs against a background of the environmental factors that shape development (Danniels, Pyle, & DeLuca, 2020; Perry et al., 2020). Authentic assessment yields results that can be used to establish learning goals, design interventions, modify curriculum and instructional methods, and create responsive environments that effectively meet children's individual developmental and learning needs.

Teachers as Classroom Observers

Regularly scheduled monitoring and assessment of children's developmental progress are benchmarks of high-quality schools and early childhood programs. Observing, recording, and reviewing children's performance in the classroom and during outdoor play gives teachers insight into their accomplishments, progress, strengths, and limitations. Information acquired through observational methods is also beneficial for identifying children who have special talents, developmental delays, health issues, or behavioral problems that may require additional evaluation. In addition, teachers can use this information to design classroom experiences and environments that are developmentally appropriate and support children's individual learning needs.

What Do You See?

Observing children in naturalistic environments. Teachers have many available options to use for assessing children's development. What developmental skills is the teacher in this photo able to evaluate? What advantages does observing the children in a classroom setting offer over conducting a formal assessment?

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Figure 1-7 Providing meaningful learning experiences for children requires observing, involving, and exchanging information with their families.

The ability to conduct and interpret meaningful observations requires that teachers be familiar with children's typical development so their expectations are accurate and realistic. They also must understand that family, culture, geographic, and linguistic differences can account for variations in what children know and are able to do. With time and practice, teachers become more proficient at identifying specific behaviors for observation, knowing what to look for, recording observations in an objective manner, interpreting their findings, and using the data to address children's individual needs.

Families as Observers

Families always should be welcome in their children's classroom, whether as scheduled observers or on a drop-in basis. They have a right to know what the children are learning and to ask questions. When family members arrange for a scheduled observation, they can be given a clipboard for noting points of interest or questions that they may want to ask about learning materials, teacher responses, or what seems to please or bother the children. A follow-up meeting should be arranged with the child's family to learn their thoughts about the classroom or program, to point out their child's positive qualities, and to share any mutual concerns about the child's progress.

It is important to always involve children's families in the assessment process and to encourage them to share their observations and questions. Families know and understand their children better than anyone else and see them behaving in almost every imaginable circumstance. They are aware of their children's likes and dislikes, joys and anxieties, and positive and negative qualities. As a result, they are often able to provide unique information about children's behavior, challenges, and talents that may be unknown to teachers. Most importantly, they may have specific goals that they want their children to achieve.

When schools create an atmosphere that encourages families to participate in the assessment process and to share information and concerns, everyone—children, families, and teachers—ultimately benefits (Figure 1-7). Ongoing communication with children's families can best be achieved in-person. However, the use of email, videoconferencing, and/or a secure classroom website can also be effective for communicating with those who experience scheduling conflicts, language obstacles, or other barriers that may limit their participation.

Observation Methods

Recorded observations assume many forms: anecdotal notes, running records and logs, time and event sampling, frequency and duration counts, checklists, rating scales, audio and video recordings, and portfolios. Each method is described briefly in the section that follows. Additional information on screening tests is available in Chapter 10, "When and Where to Seek Help," and Appendix B, "Selected Screening and Assessment Instruments."

Anecdotal Notes

Several times each day, the teacher takes a minute or so to write down a few relevant thoughts about what they see occurring. Bates, Schenck, and Hoover (2019) suggest that teachers carry index cards, Post-it notes, or a small notebook in their pocket to use for recording and organizing their observations. The teacher makes brief, dated entries about the **discrete behaviors** observed for a given child: "Played in block area for 5 minutes without hitting another child"; "Initiated conversation with teacher"; "Seemed anxious during the test."

Anecdotal notes provide a running record, or composite picture, of the child's developmental progress in one or more **domains** over a period of time. Teachers can use this information for a variety of intended purposes, including documenting a specific behavior, evaluating the effectiveness of an intervention, or determining if a child's development is progressing satisfactorily. When anecdotal notes are compiled chronologically across developmental domains, they also become a valuable tool for determining placements, writing progress reports, evaluating lesson plans, establishing learning goals, and sharing relevant information with families.

Time or Event Sampling

Sampling techniques enable a teacher to collect behavioral data on one or more children simultaneously during a given time frame or activity. For example, a teacher may be interested in learning which behaviors children use to resolve conflicts during free play: physical aggression (pa), verbal aggression (va), or cooperative problem solving (cps) skills. A simple score sheet can be developed for recording purposes, with children's names listed along one axis and the times and behavioral codes or categories identified along the other (Figure 1-8). A new sheet is dated and used for recording each day's observations.

A sampling approach often is used to obtain information about children's language development. Counts can be obtained during a live observation or from prerecorded audiotaped or videotaped sessions. An observer writes down every utterance exactly as the child says it. One purpose of the samplings, which are usually recorded for ten to fifteen minutes at a time over a monthlong period or so, is to track the child's speech and language progress. Another purpose is to see whether the child's language is functional. Is the child communicating effectively? Does the child get what they need and want by using language? No other behavior (except communicative gestures or facial grimaces) is recorded, although brief notations may be made (e.g., that other children rarely respond to the child's verbal overtures).

Language samples are invaluable for monitoring developmental progress, planning individualized programs, and/or determining if additional intervention services are needed. They are also effective for recalling humorous quips or insightful statements that the child has made.

discrete behaviors Actions that can be observed and described clearly, such as hitting, pulling hair, laughing, or spitting.

domains Areas of development such as physical, motor, social-emotional, and speech and language.

_____ **date** **Activity:** Free Play

Code:
pa – physical aggression
va – verbal aggression
cps – cooperative play/problem solving

Child	8:30 a.m.			8:40 a.m.			8:50 a.m.			9:00 a.m.		
	pa	va	cps	pa	va	cps	pa	va	cps	pa	va	cps
LaShauna												
Jose												
Markie												
Winston												

Total: pa ___ va ___ cps ___

Figure 1-8 Time sampling form.

Frequency and Duration Counts

When concerns about a specific aspect of a child's behavior arise, teachers first must determine how often the behavior occurs (frequency) or how long it continues (duration) (Figure 1-9). Observations are made and data recorded while teachers go about their daily tasks. One form of frequency count simply requires the teacher to make a tally mark every time the child engages in the specified behavior. A count might reveal that a two-year-old child who was said to cry or hit "all the time" was actually doing so only once or twice per morning, and some mornings not at all. Electronic or inexpensive digital handheld counters can be used to record behaviors that occur at a high rate. Frequency counts yield objective information that can help teachers determine if a problem indeed exists.

A duration count measures the amount of time that a child engages in a particular behavior. For example, a teacher might simply jot down the time when a child enters and leaves a learning center or activity. Another example would be penciling (unobtrusively) on a corner of a painting or collage the time that the child started and finished the project; or the teacher might note when a child's tantrum began and ended. Duration counts are helpful for deciding whether interventions are needed to increase or decrease a specific behavior.

Child's name: Findley A.
Week of: June 7–11, 2021
Observer: Juanita M.
Behavior observed: Not attending/distracting other children

Activity:	Mon	Tues	Wed	Thurs	Fri	Comments
Morning circle	II	0	II	I	III	
Afternoon circle	III	II	IIII	0	III	

Figure 1-9 Sample frequency and duration counts.

TeachSource Video Connections

Assessing Children's Development

Adults are able to support and guide children's development when they have appropriate information about a child's progress and expected achievements. Respond to the following questions after you have watched the learning video *Portfolio Assessment: Elementary Classroom*:

1. What does portfolio assessment involve?
2. What information does it provide that may not be obtainable from other assessment methods?
3. In what ways can teachers and families use portfolio assessment results to support learning?

Checklists and Rating Scales

Checklists permit a teacher or other observer to quickly record the occurrence of certain skills or behaviors. For example, in infant centers, many firsts can be checked off: the day Josie first smiled, rolled over, or walked alone. In preschools, a checklist can be an effective method for monitoring children's skill acquisition. The date can be inserted as teachers check off when, for example, Carmella correctly identified and matched her primary colors; when Jayson built a tower of eight one-inch cubes; or when Sophia zipped up her own jacket. Teachers may wish to construct their own checklists to reflect unique program objectives. The lists, whether teacher-made or commercial, can be simple or detailed, depending on the need (see Appendix A, "Developmental Checklists").

Rating scales, like checklists, usually are designed to target specific behaviors (Figure 1-10). They provide an efficient method for recording teacher observations and later retrieving that information in a meaningful way.

Portfolios

Representative examples of a child's work—drawings, digital photographs of a special block structure or science project, notes describing manipulative activities completed, audiotapes of conversations and language samples, and digital video of a class play or a child's attempts at learning a new skill—offer another effective method for monitoring children's developmental progress (Habeeb & Ebrahim, 2019; Pahlevi, Rosy, & Ranu, 2018). Teachers select materials that represent a child's learning across all developmental domains and assemble them in an individual portfolio. Children also should be invited to choose items for inclusion and to review the collection from time to time. This step affords children an opportunity to explain their ideas and engage in self-assessment.

Information obtained from teacher observations and conversations with families should also be included in this collection, as they provide additional insight and meaning to the child's products.

Figure 1-10 Sample rating scale form.

Child's name: Findley A.
Date: _____

Task:	Not Yet	Attempts/Not always accurate	Usually accurate	Proficient	Comments (observer/date):
Identifies numbers 1–10					
Arranges numbers 1–10 in correct order					
Counts from 1–10 with prompting					
Counts from 1–10 without prompting					
Writes numbers 1–10					

Portfolio contents should be reviewed and updated periodically to reflect children's changing interests, skill mastery, the need for additional instruction, or all three. The items serve as a visual resource that can be shared with families during conferences to illustrate children's unique strengths and progress. Portfolios are also useful for identifying environmental and/or instructional improvements that may be needed to support children's continued development and learning.

More teachers are adopting the use of e-portfolios for assessment purposes (Hooker, 2019). This format improves the ability to include digital examples of children's work, share contents with families, and accompany a child from grade to grade. It has been noted that children also tend to become more engaged in the assessment process and able to reflect on their own learning experiences and progress.

Summary

1-1 Current knowledge of child development is a composite of human development theories: maturational, psychoanalytic, psychosocial, cognitive-developmental, behaviorism and social learning, bioecological, and essential needs.

- All theories concur that meeting children's basic physical and psychological needs is a powerful determinant of optimum development.
- Current explanations about how children grow and develop rarely rely on any one exclusive theory. Each theory has made major contributions to our understanding of children's behavior.
- Scientists view human development as a product of biological and environmental interactions; they dismiss the nature vs. nurture question as improbable as an either/or proposition.

1-2 Teachers and families play an important role in gathering and contributing information about children's growth and development.

- Authentic assessments provide a comprehensive understanding of children's unique interests, abilities, talents, and needs.
- The process of documenting children's behavior enables teachers to make necessary adjustments in their curricula and instructional methods to improve and support learning.

1-3 Methods commonly used for monitoring children's developmental progress include observation, anecdotal notes, time/event sampling, frequency and duration counts, checklists, rating scales, and portfolios.

Key Terms

nature vs. nurture **p. 3**
norms **p. 4**
constructivism **p. 5**
Zone of Proximal development **p. 7**
at risk **p. 11**
essential needs **p. 11**
nurturing **p. 11**
reciprocal **p. 11**
developmentally appropriate **p. 11**
intrinsic **p. 12**
self-esteem **p. 12**
descriptive praise **p. 12**
naturalistic settings **p. 13**
authentic assessment **p. 13**
discrete behaviors **p. 16**
domains **p. 16**

Apply What You Have Learned

A. Case Study Connections

Reread the developmental sketch about Tucker at the beginning of the chapter and answer the following questions.

1. What conditions or circumstances may have influenced Tucker's developmental progress to date? Explain your answer based on the theories described in this chapter.
2. Although Tucker's motor development has been somewhat delayed, he has learned to sit up, crawl, stand, walk, and eventually run. Which is more important to consider in his case, the fact that he was older than is typical when he learned these skills, or that he has developed them in this particular order? Explain.
3. Based on the brief description of Tucker and his current foster family, what reciprocal effect(s) might you anticipate when he crawls up onto his mother's lap? How would Skinner and Bandura explain this response?

B. Review Questions

1. What is the nature vs. nature controversy? How does it contribute to our understanding of children's development?
2. What are some behaviors that children would be likely to exhibit during each of the first five stages of Erikson's developmental theory (infancy–adolescence)?
3. In what ways does the maturational theory differ from the cognitive-developmental theory?
4. What is behaviorism, and how does it explain why a child might continue to refuse eating despite repeated warnings from her mother?
5. What data collection method(s) would you use to confirm or refute your suspicions about a child's ability to complete a specific task?

C. Your Turn: Chapter to Practice

1. Use Bronfenbrenner's ecological model to diagram the environmental factors that have influenced your development. Interview a friend or colleague and repeat this exercise. In what ways are the two models similar? Different?
2. Develop five schemas for the word *apple*.
3. Select an age-specific speech-language milestone (see the section "Speech and Language Development," in Chapters 4–9). Conduct a ten-minute observation with a child of this age and record the data using anecdotal notes. Repeat the exercise (with the same child and milestone) using a time or event sampling method. Compare and contrast your experiences with each of the assessment tools. What did you like or dislike about each method?
4. Determine where developmental screenings are conducted in your community. Contact the agency and make arrangements to observe or volunteer to assist with a screening session.

Online Resources

Children's Defense Fund

The Children's Defense Fund is a private, nonprofit organization that serves as a national voice for children, especially those who have disabilities, live in poverty, or are of minority backgrounds. They support policy and programs designed to help children succeed in life.

Council for Exceptional Children (CEC)

The Council for Exceptional Children (CEC) is the largest international professional organization dedicated to advocating and improving educational outcomes for persons with exceptionalities, disabilities, giftedness, or all three.

National Center for Cultural Competence (NCCC)

The National Center for Cultural Competence (NCCC), located at the Georgetown University Center for Child and Human Development, conducts research and provides national leadership, consultation, training, assessment tools, and resource information for agency personnel, health professionals, educators, and family advocates.

Society for Research in Child Development (SRCD)

The stated mission of the Society for Research in Child Development (SRCD) is to support, organize, and disseminate interdisciplinary, child development research findings. Their publications include *Child Development, Child Development Perspectives, Monographs, and Social Policy Report*.

References

Bandura, A. (1977). *Social learning theory*. New York: General Learning Press.

Bates, C. C., Schenck, S. M., & Hoover, H. J. (2019). Anecdotal records: Practical strategies for taking meaningful notes. *Young Children, 74*(3), 14–19.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Bruchhage, M. M., Ngo, G., Schneider, N., D'Sa, V., & Deon, S. C. (2020). Functional connectivity correlates of infant and early childhood cognitive development. *Brain Structure and Function, 225*(2), 669–681.

Chen, M., Ma, F., Wu, J., Li, S., Zhang, Z., Fu, Y., Lu, C., & Guo, T. (2020, May). Individual differences in language proficiency shape the neural plasticity of language control in bilingual language production. *Journal of Neurolinguistics, 54*, 100887. https://doi.org/10.1016/j.jneuroling.2020.100887

Dalton, T. (2005). Arnold Gesell and the maturation controversy. *Integrative Psychological & Behavioral Science, 40*(4), 182−204.

Danniels, E., Pyle, A., & DeLuca, C. (2020). The role of technology in supporting classroom assessment in play-based kindergarten. *Teaching and Teacher Education, 88*, 102966. https://doi.org/10.1016/j.tate.2019.102966

DeLuca, C., Pyle, A., Valiquette, A., & LaPointe-McEwan, D. (2020). New directions for kindergarten education: Embedding assessment in play-based learning. *The Elementary School Journal, 120*(3), 455–479.

Dufford, A. J., Kim, P., & Evans, G. W. (2020). The impact of childhood poverty on brain health: Emerging evidence from neuroimaging across the lifespan. *International Review of Neurobiology, 150*, 77–105.

Edgar, J. C. (2020). Identifying electrophysiological markers of autism spectrum disorder and schizophrenia against a backdrop of normal brain development. *Psychiatry and Clinical Neurosciences, 74*(1), 1–11.

Erikson, E. (1950). *Childhood and society*. New York: Vintage.

Evans, S. C., Blossom, J. B., & Fite, P. J. (2020). Exploring longitudinal mechanisms of irritability in children: Implications for cognitive behavioral intervention. *Behavior Therapy, 51*(2), 238–252.

Fox, H. C., Karim, A., & Syed, S. A. (2020). Bio-behavioral indices of emotion regulation: Potential targets for treatment of addiction. *Current Addiction Reports, 7*, 333–343.

Freud, S. (1923). *The Ego and the Id*. Vienna, Austria: W. W. Norton & Company.

Gesell, A., & Ilg, F. (1949). *Child development*. New York: Harper.

Habeeb, K. M., & Ebrahim, A. H. (2019). Impact of e-portfolios on teacher assessment and student performance on learning science concepts in kindergarten. *Education Information Technologies, 24*(3), 1661–1679.

Honeycutt, H. (2019, September 30). Nature and nurture as an enduring tension in the history of psychology. *Oxford Research Encyclopedia of Psychology*. https://doi.org/10.1093/acrefore/9780190236557.013.518

Hooker, T. (2019). Using ePortfolios in early childhood education: Recalling, reconnecting, restarting and learning. *Journal of Early Childhood Research, 17*(4), 376–391.

Jiang, H., Justice, L. M., Purtell, K. M., & Bates, R. (2020). Exposure to environmental toxicants and early language development for children reared in low-income households. *Clinical Pediatrics, 59*(6), 557–565.

Jirout, J., LoCasale-Crouch, J., Turnbull, K., Gu, Y., Cubides, M., Garzione, S., Evans, T.M., Weltman, A.L., & Kranz, S. (2019). How lifestyle factors affect cognitive and executive function and ability to learn in children. *Nutrients, 11*(8), 1953. doi:10.3390/nu11081953.

Killion, B. E., & Weyandt, L. L. (2020). Brain structure in childhood maltreatment related PTSD across the lifespan: A systematic review. *Applied Neuropsychology; Child, 9*(1), 68–82.

Loomis, A. M. (2020, April 6). Effects of household and environmental adversity on indices of self-regulation for Latino and African American preschool children: Closing the school readiness gap. *Early Education and Development, 31*(1), 1– 21.

Mangione, P. L., Osborne, T., & Mendenhall, H. (2019). How learning progressions help teachers support children's development and learning. *Young Children, 74*(3), 20–25.

Markova, G., Nguyen, T., & Hoehl, S. (2019, September 18). Neurobehavioral interpersonal synchrony in early development: The role of interactional rhythms. *Frontiers in Psychology*. Retrieved from https://www.frontiersin.org/articles/10.3389/fpsyg.2019.02078/full.

Marotz, L. R. (2019). *Health, safety, and nutrition for the young child* (10th ed.). Boston, MA: Cengage Learning.

Maslow, A. (1968). *Toward a psychology of being* (2nd ed.). New York: Van Nostrand Reinhold.

McCollow, M. M., & Hoffman, H. H. (2019). Supporting social development in young children with disabilities: Building a practitioner's toolkit. *Early Childhood Education Journal, 47*(3), 309–320.

McGuire, A., & Jackson, Y. (2020). The role of trauma type and age in the relation between trauma exposure and intelligence. *Child Maltreatment, 25*(2), 192–202.

Montag, C., Ebstein, R. P., Jawinski, P., & Marke, S. (2020). Molecular genetics in psychology and personality neuroscience: On candidate genes, genome wide scans, and new research strategies. *Neuroscience & Biobehavioral Reviews, 118*, 163–174.

National Association for the Education of Young Children (NAEYC). (2020). Developmentally Appropriate Practice (DAP) position statement (4th ed.). Retrieved from https://www.naeyc.org/resources/position-statements.

Pahlevi, T., Rosy, B., & Ranu, E. M. (2018). A scientific approach based on portfolio assessment for autonom problem solving. *International Journal of Educational Research Review, 3*(2), 29–36.

Perry, N. E., Lisaingo, S., Yee, N., Parent, N., Wan, X., & Muis, K. (2020). Collaborating with teachers to design and implement assessments for self-regulated learning in the context of authentic classroom writing tasks. *Assessment in Education: Principles, Policy & Practice, 27*(4), 416–443.

Piaget, J. (1954). *The construction of reality in the child*. New York: Basic Books.

Pool, J. L., & Hampshire, P. (2019). Planning for authentic assessment using unstructured and structured observation in the preschool classroom. *Young Exceptional Children, 23*(3), 143–156.

Poole, K. L., Santesso, D. L., Van Lieshout, R. J., & Schmidt, L. A. (2019). Frontal brain asymmetry and the trajectory of shyness across the early school years. *Journal of Abnormal Child Psychology, 47*(7), 1253–1263.

Roos, A., Fouche, J., du Toit, S., du Plessis, S., Stein, D. J., & Donald, K. A. (2020). Structural brain network development in children following prenatal methamphetamine exposure. *Journal of Comparative Neurology, 528*(11), 1856– 1863.

Schlesinger, M. A., Hassinger-Das, B., Zosh, M., Sawyer, J., Evans, N., & Hirsh- Pasek, K. (2020). Cognitive behavioral science behind the value of play: Leveraging everyday experiences to promote play, learning, and positive interactions. *Journal of Infant, Child, and Adolescent Psychotherapy, 19*(2), 202– 216.

Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. New York: Appleton-Century.

Taylor, M. E., & Boyer, W. (2020). Play-based learning: Evidence-based research to improve children's learning experiences in the kindergarten classroom. *Early Childhood Education Journal, 48*(10), 127–133.

Tervo-Clemmens, B., Quach, A., Calabro, F. J., Foran, W., & Luna, B. (2020). Meta-analysis and review of functional neuroimaging differences underlying adolescent vulnerability to substance use. *NeuroImage, 209*, 116476. https://doi.org/10.1016/j.neuroimage.2019.116476

van Rooij, S. J., Smith, R. D., Stenson, A. F., Ely, T. D., Yan, X., Tottenham, N., Stevens, J. S., & Jovanovic, T. (2020). Increased activation of the fear neurocircuitry in children exposed to violence. *Depression & Anxiety, 37*(4), 303– 312.

Vygotsky, L. (1986). *Thought and language* (2nd ed.). Cambridge, MA: MIT Press.

Wang, Y., Tian, L., & Huebner, E. S. (2019). Basic psychological needs satisfaction at school, behavioral school engagement, and academic achievement: Longitudinal reciprocal relations among elementary school students. *Contemporary Educational Psychology, 56*, 130–139.

Wilkey, E. D., Pollack, C., & Price, G. R. (2020). Dyscalculia and typical math achievement are associated with individual differences in number-specific executive function. *Child Development, 91*(2), 596–619.

Wood, J. J., Kendall, P. C., Wood, K. S., Kerns, C. M., Seltzer, M., Small, B. J., Lewin, A. B., & Storch, E. A. (2020). Cognitive behavioral treatments for anxiety in children with autism spectrum disorder: A randomized clinical trial. *JAMA Psychiatry, 77*(5), 474–483.

Chapter **2**

Principles of Growth and Development

Learning Objectives

After reading this chapter, you will be able to:

2-1 Define growth and development as separate concepts and provide at least two examples of each.

2-2 Defend this statement: "Sequence, not age, is the important factor in evaluating a child's developmental progress."

2-3 Identify and briefly describe the six major developmental domains that are the focus of this text.

NAEYC NAEYC Professional Standards Linked to Chapter Content

1a, 1b, and 1c: Child development and learning in context

2a: Family–teacher partnerships and community connections

4a and 4b: Developmentally, culturally, and linguistically appropriate teaching practices

Dakota and Liselli, identical twins soon to be three years old, weighed in at a little over four pounds each at birth. Despite having being born two months early and considered to be low-birth-weight infants, both are now strong and healthy. They look alike in almost every way, with dark brown eyes, thick eyelashes, and high cheekbones. Dakota and Liselli's young parents recently moved with their twins to a nearby state where they would begin to attend college.

Although Dakota and Liselli behave alike in many ways, there are also noticeable differences. Since early infancy, Dakota has been more physically active. She slept less, ate more, sat up, crawled, and walked alone weeks before Liselli (or other babies her age, for that matter). She has also been more adventuresome in attempting new experiences, such as learning to swim and riding a tricycle. Liselli, on the other hand, was the first to smile, play peek-a-boo, and say recognizable words. She now uses complete sentences and has considerable letter, word, and number recognition skills. She likes to "read" to

Dakota and acts as her interpreter when Dakota can't make herself understood. In turn, Dakota is first to protect and comfort Liselli whenever she is hurt or frightened.

Dakota and Liselli's parents enrolled the girls in a Head Start program conveniently located on the college campus. During a recent health screening session, Liselli failed her initial vision test and was referred to an eye specialist for additional evaluation. The optometrist determined that Liselli is nearsighted and requires corrective glasses. Although the girls were initially reluctant to join in group activities, they are beginning to make several "friends" but still seldom venture too far from one another.

Ask Yourself

- From the brief descriptions of Dakota and Liselli, which developmental characteristics can be attributed solely to genetic makeup?
- In what ways may environment account for differences in the girls' development?
- How do Dakota and Liselli's motor skills differ?

Basic Patterns and Concepts

Groups of children of approximately the same age, across all cultures, appear to be remarkably similar in size, shape, and developmental abilities. However, closer observation also reveals a wide range of individual differences within these groups (Figure 2-1). Both similarities and differences depend on a child's unique patterns of growth and development. What defines this complementary process of *growth and development*? Why do children experience this progression differently? Although these terms are often used interchangeably, they do not describe identical concepts.

Monstera/Pexels

Figure 2-1 Children's development includes a wide range of individual differences.

Growth

Growth refers to specific physical changes and increases in the child's size. An increase in cell numbers and enlargement of existing cells are responsible for the observable gains in a child's height, weight, **head circumference**, shoe size, length of arms and legs, body shape, and many other notable changes. Growth also lends itself to direct and fairly reliable measurement.

The growth process continues throughout the life span, although the rate varies by age. For example, growth occurs rapidly during infancy and adolescence but is typically much slower and less dramatic in the toddler and middle school years. The body continues to repair and replace its cells throughout adulthood, even into old age, although much less vigorously during these times.

Growth is a sensitive indicator of a child's overall wellness. Genetic growth parameters are set prior to birth, but it is the interaction with environmental factors that ultimately determines whether this potential will be realized. Children who have access to a nutritious diet, nurturing care, medical treatment, and opportunities for play and physical activity are most likely to achieve optimal growth. By contrast, children who are exposed to toxic environmental conditions, such as poverty, maltreatment, food insecurity, or lack of health care are at greater risk for delayed or stunted growth (Black, Trude, & Lutter, 2020; Raiten & Bremer, 2020).

Development

Development refers to an increase in complexity—a change from the relatively simple to the more complex and advanced. This process involves an orderly progression along a continuum or pathway over time. Little by little, knowledge, behaviors, and skills are learned and refined. Although the developmental sequence across domains is basically the same for all children, the rate and degree of attainment can vary greatly from child to child.

The progressive acquisition of developmental skills involves a dynamic interaction of biological and environmental factors (nature *and* nurture). Neurological, muscular, and skeletal systems must reach a certain functional maturity before a child is capable of learning a particular skill. At the same time, the social, cultural, ethnic, and linguistic context in which a child is growing up influences what is likely to be learned (Figure 2-2). Collectively, these factors account for the wide range of individual differences observed in children's developmental progress. For example, families in many cultures encourage

Tatiana Syrikova/Pexels

Figure 2-2 Learning to walk is a complex developmental and maturational process.

growth Physical changes leading to an increase in size.

head circumference Measurement of the head taken at its largest point (across the forehead, around the back of the head, and returning to the starting point).

development Refers to an increase in complexity, from simple to more complicated and detailed.

their children to begin crawling, walking, and self-feeding at an early age, whereas in other cultures, the early acquisition of these skills is not highly valued or supported. Children living in poor, inner-urban neighborhoods may have delayed motor skills due to fewer safe opportunities for organized and spontaneous outdoor play.

Developmental Milestones

Major markers or points of accomplishment are referred to as *developmental milestones.* They provide a functional guide that can be useful for tracking the emergence of children's motor, social, cognitive, and language skills. Milestones represent behaviors that appear in somewhat orderly steps and within fairly predictable age ranges for typically developing children. For example, almost every child begins to smile socially by ten to twelve weeks and to speak a first word or two at around twelve months. These achievements are only two of the many significant behavioral indications that a child's developmental progress is on track. When children fail to achieve one or more developmental milestones within a reasonable time frame, careful and systematic monitoring by a child development specialist or health care provider is necessary.

Sitting, walking, and talking are examples of developmental milestones that depend on biological maturation, yet these skills do not develop independently of the environment. For example, learning to walk requires muscle strength and coordination. In addition, it requires an environment that encourages practice, not only of walking as it emerges but also of the behaviors and skills that precede walking, such as rolling over, sitting up, and standing. It is also important to recognize that differences in children's biological makeup affect the ways in which they experience and respond to their environment. For example, a hearing loss may significantly alter a child's concept of language, interest in talking, and development of linguistic skills, even if the child lives in a literacy-rich environment.

Sequences of Development

A sequence of development is composed of predictable steps along a developmental pathway common to the majority of children. This process sometimes is referred to as **continuity**. Children must be able to roll over before they can sit, and sit before they can stand. *The critical consideration is the order in which children acquire these developmental skills, not their age in months and years.* The appropriate sequence in each developmental area is an important indication that the child is moving steadily forward along a sound developmental continuum (Figure 2-3). For example, in language development, it does not matter how many words a child speaks by two years of age. What is important is that the child has progressed from cooing and babbling to jabbering (inflected **jargon**) to syllable production. The two- or three-year-old who has progressed through these stages usually also produces words and sentences within a reasonable period of time.

Some scientists explain children's development from a different point of view, believing that development occurs in a series of stages rather than as a gradual progression from simple to complex. They refer to this process as **discontinuity**. For example, rolling over, sitting up, and standing are considered distinct and abrupt steps that precede walking. It isn't necessary for a child to perfect one skill set before attempting another that may be more advanced.

In any case, developmental progress is rarely a smooth and even process. Irregularities, such as periods of **stammering** or the onset of a **food jag**, are not uncommon. Regression, or taking a step or two backward now and then, is also perfectly normal and to be expected. For example, a child who has been toilet trained for some time may begin to have accidents at times of stress, such as starting school or welcoming a new sibling into the family. An older child may resort to hitting or become verbally aggressive following a family move or a parent's divorce. Children are usually able to overcome these temporary setbacks and to gradually move on when adults provide them with compassionate support, understanding, and direction.

continuity Developmental progress that gradually becomes increasingly refined and complex.

jargon Unintelligible speech; in young children, it usually includes sounds and inflections of the native language.

discontinuity Development that occurs in irregular periods or stages; not a smooth, continuous process.

stammering To speak in an interrupted or repetitive pattern; not to be confused with stuttering.

food jag A period when only certain foods are preferred or accepted.

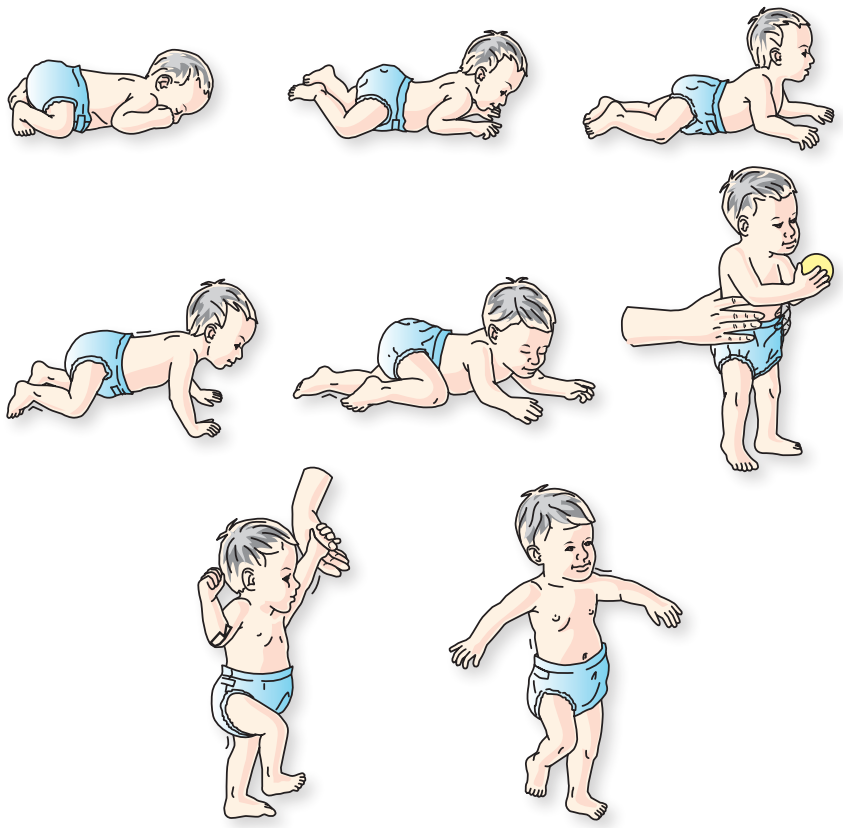

Figure 2-3 Typical motor development sequence.

Age-Level Expectancies or Norms

Age-level expectancies can be thought of as **chronological**, or age-related, levels of development. Psychologists, including Gesell, Piaget, and Erikson, conducted hundreds of systematic observations of infants and children of various ages. Analyses of their findings represent the average or typical age at which many specifically described developmental skills are acquired by most children in a given culture (Gesell & Ilg, 1949; Piaget, 1954). This average age is often referred to as the *norm*. Thus, a child's development may be described as at the norm, above the norm, or below the norm. For example, a child who begins walking at eight months is ahead of the norm (twelve to fifteen months), whereas a child who does not walk until twenty months is considered to be below the norm.

Age-level expectancies *always represent a range and never an exact point in time* when specific skills are most likely to be achieved. Therefore, profiles described in this text (age expectancies for specific skills) always must be interpreted as approximate midpoints on a range of months (as in the example on walking, the range is from eight to twenty months, with the midpoint at fourteen months). Once again, a reminder: It is *sequence*, not age, that is the important factor in evaluating a child's progress (Estrada et al., 2019; Kabha & Berger, 2020; Monier & Droit-Volet, 2019).

In real life, no child is typical in every way. The range of skills and the age at which skills are attained show great individual and cultural variation. Relevant again is the example of walking—one infant may begin at eight months and another not until twenty months (many months apart on either side of the norm). No two children grow and develop at exactly the same rate, nor do they perform in exactly the same way. For example, there are a half-dozen ways to creep and crawl. Most children, however, use what is referred to as *contralateral locomotion*, an opposite knee–hand method of getting

chronological Refers to events or dates occurring in sequence over the passage of time.

about prior to walking. Yet, some normally walking two-year-olds never crawl, indicating a distinct variation in typical development.

Organization and Reorganization

Development can be thought of as a series of phases. Spurts of rapid growth and development often are followed by a period of disorganization. During this time, the child works to regain confidence by practicing a new skill until it is mastered. Once this has been achieved, the child seems to recover and move into a period of reorganization. It is not uncommon for children to demonstrate behavior problems or even regression during these phases. Perhaps a new baby has become an active and engaging older infant who is now the center of family attention. At the same time, mother may expect three-year-old brother to help dress himself in the morning. He may begin to have tantrums over minor frustrations, and for the time being, revert to babyish ways and lose his hard-won bladder control. In most instances, these periods are relatively short-lived. Almost always, the three-year-old will learn more age-appropriate ways of gaining attention if given adequate adult encouragement and support.

Typical Growth and Development

In terms of development, the words **typical** and *normal* often are used interchangeably to describe the acquisition of certain skills and behaviors according to a predictable rate and sequence. However, as previously stated, the range of typical behaviors within each developmental domain is broad and includes mild variations and simple irregularities, such as the three-year-old who stutters or the twelve-month-old who learns to walk without having crawled. The use of these terms also oversimplifies the concept. Normal or typical development implies:

- An integrated process governing change in size, **neurological** structure, and behavioral complexity.
- A cumulative or building-block process in which each new aspect of growth or development includes and builds on earlier changes; each accomplishment is necessary to the acquisition of the next set of skills.
- A continuous process of give and take (reciprocity) between the child and the environment, each changing the other in a variety of ways. For example, the four-year-old drops a glass and breaks it, and the parent scolds the child. Both events—the broken glass and the adult's displeasure—are environmental changes that the child triggered. From this experience, the child might learn to hold on more firmly next time, which constitutes a change in both the child's and the adult's behavior—fewer broken glasses, thus less adult displeasure.

Interrelatedness of Developmental Domains

Discussions about development usually focus on several major domains: physical, motor, perceptual, cognitive, social-emotional, and language. However, no single area develops independently of the others. Every skill a child attempts, whether simple or complex, requires a mix of developmental abilities. Social skills are a prime example. Why are some young children said to have good social skills? Often the answer is because they play well with other children and are sought out as playmates. To be a preferred playmate, a child must have many skills, all of them interrelated and interdependent. For example, a four-year-old should be able to:

- Run, jump, climb, and build with blocks (good motor skills)
- Ask for, explain, and describe what is going on (good language skills)

typical Refers to the achievement of certain skills according to a fairly predictable sequence, although with many individual variations.

neurological Refers to the brain and nervous system.

What Do You See?

The interplay of developmental domains. Multiple domains are actively involved in the completion of any task, from dressing oneself to putting together a puzzle. Look closely, and identify the developmental skills and domains required for this child to thread the string through the block successfully.

- Recognize similarities and differences among play materials and thus be able to select appropriate materials in a joint building project (good perceptual skills)
- Problem-solve, conceptualize, and plan ahead in cooperative play ventures (good cognitive skills)

Every developmental area is well represented in the preceding example, even though social development was the primary area under consideration. A significant delay in any one domain is likely to disrupt typical developmental progression in the others. For this reason, it is important to always monitor children's developmental progress across all domains.

Brain Growth and Development

Brain maturation lays the foundation for all other aspects of a child's development. Growth and development of the fetal brain is rapid, exceedingly complex, and influenced by a combination of maternal environment and genetics (see Chapter 3, "Prenatal Development"). Healthy conditions and maternal lifestyle practices foster optimal brain formation, whereas adverse conditions, such as fetal exposure to alcohol, smoke, or maternal depression, can have a negative effect and place the child at lifelong risk (Estrada et al., 2019; Kabha & Berger, 2020; Monier & Droit-Volet, 2019).

A child's brain continues to grow and to be shaped through the daily interaction of genetic materials and daily experiences. Infants are born with an excess of brain cells (neurons)—an estimated 10 billion—more than adults have or will ever need! However, these

TeachSource Video Connections

Source: https://www.youtube.com/watch?v=m_5u8-QSh6A.

Brain Development in Infancy

Early brain development sets the stage for future learning and success. Adults play a critical role in fostering this early development by providing young children with enrichment opportunities, positive support, and consistent nurturing and care. Respond to the following questions after you have watched the video *Serve and Return Interaction Shapes Brain Circuitry.*

1. What triggers the formation of neural connections?
2. What type of learning experiences can adults provide to promote children's brain development?

Did You Know ?

...that infants are born with all the brain cells that they will ever have? This is one of the main reasons why a mother's diet and lifestyle practices during pregnancy are so critical.

neurons are relatively nonfunctional until connections are established and organized into purposeful networks. **Neural connections** are formed when chemical and electrical reactions in the brain are activated by sensory input and learning experiences. Once established, these neural connections enable brain cells to communicate with one another and to perform purposeful activities (Figure 2-4). Each time an experience is repeated, the neural connection becomes stronger. For example, consider the infant who is initially unable to feed himself, then learns to hold a cup and spoon after much practice, and eventually is able to eat a meal without giving much thought to the mechanics involved.

Children's brains continue to increase in size as neurons grow larger and neural connections become more complex. An infant's brain triples in weight by the end of the first year; a toddler's brain weighs approximately three-fourths that of an adult's. Growth is especially remarkable during the first three or four years, when the brain is most flexible and receptive to learning. This quality, known as **plasticity**, accounts for the young child's unique ability to acquire skills quickly (Reh et al., 2020). It explains, for example, why a four-year-old who is learning English as a second language is able to understand and converse in a significantly shorter period of time than an adult would require.

Weak or seldom-used connections are eliminated gradually through a natural process known as **pruning** in order to make room for active cells and expanding networks. Selective pruning begins in earnest at around age 10 and peaks in early puberty. This "use it or lose it" process is ongoing throughout an individual's life, although it occurs at a slower pace with aging. It explains why infants who are born with the capability of reproducing sounds in any language eventually learn to communicate in their own native language but not in any of the others; or why one child becomes an outstanding pianist while another excels at playing sports or chess.

Research has revealed an amazing relationship that exists between a child's brain development and language acquisition (Adibpour et al., 2020; Laing & Bergelson, 2020). For example, infants not only take in the sounds of the language they are hearing, but they also replicate them, complete with a dialect. Furthermore, the dialect is maintained without change for years to come. It is as if, in the case of language development, the brain will not easily sever connections made in the earliest months and years of life, regardless of subsequent changes in language environments.

neural connections Organized linkages formed between brain cells as a result of learning.

plasticity The brain's ability to change and reorganize its structure as a result of learning.

pruning The process of eliminating unused neurons and neural connections to strengthen those that the child is actively using.

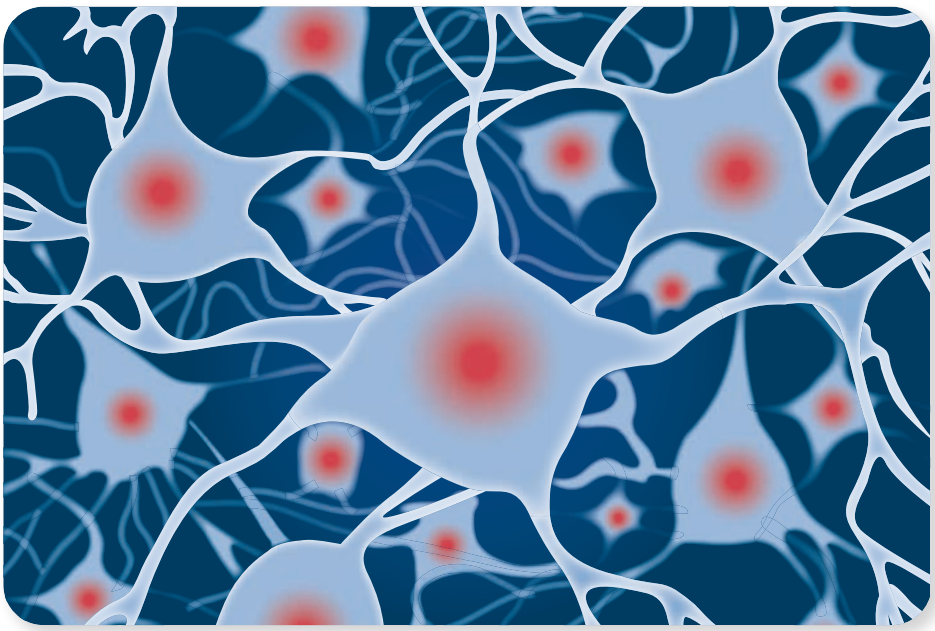

Figure 2-4 Neural connections become stronger through repetition of an activity or behavior.

It has long been thought that the child's brain simply continues to mature and increase in complexity because of ongoing experiences. However, neuroscientists used modern technologies to examine the adolescent brain and have discovered that this isn't the case. What they found was that a new layer of gray matter forms on the brain's frontal lobes during adolescence. Their discovery is especially significant because this particular region of the brain is responsible for regulating emotion, impulsivity, and decision-making processes (Xu et al., 2020). Once again, new neural connections must be established in these areas through repeated experience, refinement, and pruning before they are able to perform with any degree of consistency and adultlike sophistication. This finding helps explain why adolescents are more likely to engage in risk-taking behaviors and to make seemingly irrational decisions that adults often find puzzling (McIlvain et al., 2020).

Again, it is critical to remember that the interplay of genetic materials and daily experiences—positive as well as negative—determine how the brain's architectural structure ultimately forms. For example, growing up in a neglectful or chaotic home environment can alter the structure of neural connections and wire a child's brain for instinctive survival rather than for cognitive tasks. In contrast, a positive, supportive home environment and opportunities for learning are conducive to healthy brain development. However, an impairment may influence the way in which a child experiences and interprets everyday activities and also affect the brain's structure differently.

Spotlight on **Neuroscience** and **Brain Development**

Early Adversity and Atypical Brain Development

Researchers have long focused on adversity and its negative effects on individual health outcomes, disease, and longevity. More recently, they have turned their attention to how children's neurocognitive development is affected. What they have learned is that growing up in a disadvantaged or toxic environment changes the brain's size, physical structure, and organization (Dufford, Kim, & Evans, 2020; Nelson & Gabard-Durnam, 2020). These deviations significantly compromise memory, attention, language, and self-regulation abilities and set children on a negative trajectory for the rest of their lives (Jiang et al., 2020; Rod et al., 2020).

Approximately 35.2 million people in the United States, including 5.3 million children under age eighteen, lived in food-insecure households in 2019 (USDA, 2020) (Figure 2-5). Insufficient food and poor prenatal diet combined with poverty-related stress are factors known to have an adverse effect on fetal growth and brain development (Fitzgerald, Hor, & Drake, 2020; Franke et al., 2020). These children often continue to grow up in economically disadvantaged homes and, thus, face a higher incidence of maltreatment, a lack of reading and play materials, violent neighborhoods, and unsafe, unpredictable housing.

Chronic exposure to adversity and toxic stress eventually alters the way in which neural connections are established in the brain, preparing it for basic existence rather than for learning. The combined effect of early structural and learning deficits seriously limits children's development, leaves them unprepared for school, and interferes with academic achievement (Loomis, 2021; Tooley et al., 2020). It also increases children's likelihood of developing serious behavioral and mental health problems later in life (Franke et al., 2020; Gete, Waller, & Mishra, 2021). Perhaps it would be more appropriate to classify adversity as a disease rather than a social problem. It affects a large segment of the population, has observable symptoms caused by environmental factors, impairs an individual's ability to function, and can be transmitted from one person to another.

(*continued*)

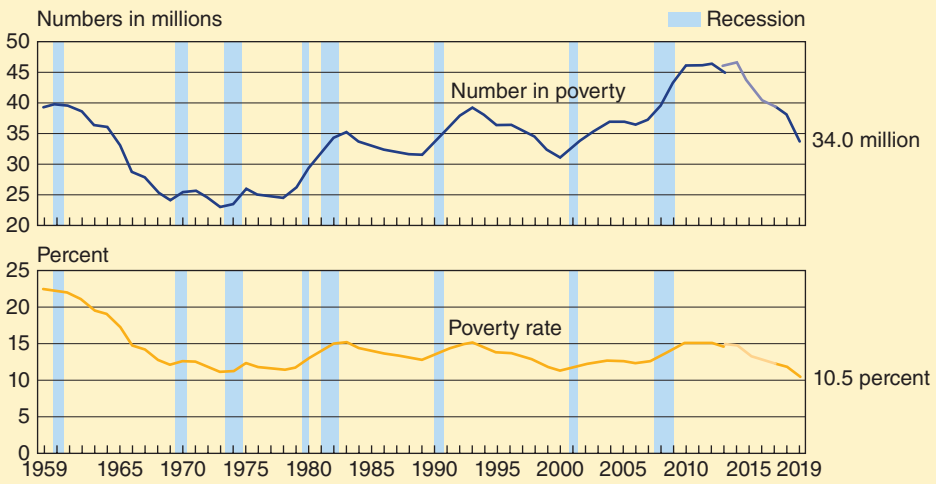

Figure 2-5 Number living in poverty and poverty rate: 1959 to 2019.

Source: U.S. Census Bureau, Current Population Survey, 1960–2020 Annual Social and Economic Supplements, https://www.census.gov/library/publications/2020/demo/p60-270.html.

What are the connections?

1. How might children's early adversity exposure contribute to chronic school failure?
2. What intervention services and assistance programs are needed to help mitigate poverty's early and cyclical effects on children's development?

Attachment

Theorists have suggested that infants and their parents are innately driven to form an emotional connection with one another. This **attachment** process is thought to be a protective response and one that improves an infant's chances for survival. A secure attachment also plays an important role in social-emotional and brain development and enables children to explore and gradually move beyond a caregiver's comfort and protection.

Freud concluded that attachments were formed as a result of a mother's feeding relationship with her infant. This idea was later dispelled by Harlow and Zimmermann (1958), who suggested that infants have a biological or "tactile need" to be touched and held. The resulting comfort and security they experience is considered essential to an attachment formation. Erikson (1968) hypothesized that attachment relationships were established during the child's first year of life and were based on a child's feelings of trust vs. mistrust.

The idea that infants are programmed instinctively to form an emotional connection with a primary caregiver was also fundamental to Bowlby's (1969, 1988) theory of attachment. He suggested that this relationship forms in stages and becomes increasingly focused, purposeful, and insightful as children's cognitive and motor skills advance:

- Birth to 2 months – Infant shows no preference for a specific caregiver; responds similarly to anyone who satisfies their needs.
- 2 to 8 months – Infant begins to recognize and respond to a preferred caregiver.
- 8 to 24 months – Child forms a strong connection with specific caregivers; becomes wary and distressed when approached by other persons, which are expressions of **separation anxiety**.
- 24 months and beyond – Child develops some emotional understanding of other people's feelings and objectives and begins to reciprocate; continues to maintain physical closeness with preferred caregivers.

attachment A strong emotional connection usually formed between a child and parent(s).

separation anxiety Extreme fear or distress that a child experiences when separated from their primary caregiver; occurs most commonly between 9 and 24 months-of-age.

Few had questioned whether there were individual differences in the quality of children's attachment until Ainsworth (1979) developed her "Strange Situation" experiment. She conducted a series of observations in which (1) a toddler played in a room when the mother was present, (2) the mother left and a stranger entered the room and, finally, (3) the child and mother were reunited. Ainsworth concluded from the data that there were significant differences in the attachment quality among children. She described three attachment styles, and later added a fourth, based on the degree of security or insecurity that individual children displayed:

- *Securely attached* – Children continued to play after their mother left the room and the stranger appeared.
- *Insecure avoidant* – Children hesitated momentarily when their mother left the room, acknowledged the stranger when they entered the room, but then continued to play.
- *Insecure resistant* – Children become alarmed and distressed, clung to their mother, and cried inconsolably when she attempted to leave; they stopped playing until their mother returned to the room, then clung to her once again.
- *Insecure disorganized* – Children appeared confused, fearful, and unsure of what to do. They stopped playing, then appeared to be upset (e.g., thrashing about, crying, unable to be comforted) when she returned.

A secure attachment relationship is formed and strengthened through consistent, caring, and supportive interactions between a child and their parent or primary caregiver. Researchers have found that children are also capable of forming meaningful attachments with multiple caregivers and that each contributes different, but important, qualities to the child's development (Brown & Cox, 2020; Fernandes et al., 2020). Child–adult attachment relationships are a reflection of cultural values and, thus, assumptions about their nature must be made with caution (Granqvist, 2021; Strand, 2020; Strand, Vossen, & Savage, 2019).

Many variables can interfere with attachment strength and stability. Women who experience unwanted pregnancy, previous pregnancy loss, a lack of partner support, or postpartum depression are less likely to form a healthy attachment with their infant (Landi et al., 2020; Rollè et al., 2020). Medical conditions may limit a mother's ability to care for her infant and to establish a secure emotional bond. A mismatch in child–parent temperaments may increase negative interactions and result in a dysfunctional attachment (Augustine & Stifter, 2019; Carrasco, Delgado, & Holgado-Tello, 2020). The early identification of potential risk factors and implementation of attachment-focused interventions is, thus, essential for promoting a healthy parent–child relationship.

Temperament

The term *temperament* refers to the genetic foundation of an individual's personality (Zwir et al., 2020). It describes psychological qualities that are characteristic of a person's emotional reactions and regulation, such as intensity, disposition or mood, and persistence. Temperament also accounts for children's individual physiological differences in behavior patterns, including activity level, predictability, emotionality, and manner of reacting and adapting to unfamiliar experiences (Figure 2-6). Thomas and Chess (1977) categorized and labeled these behaviors as the "easy" child, the "difficult" child, and the "slow-to-warm" child. They found that approximately 65 percent of children fall into one of these three categories: 40 percent of children are considered "easy," 15 percent are regarded as "slow-to-warm," and 10 percent are seen as "difficult." The remaining 35 percent of children may exhibit characteristics in more than one category.

Anete Lusina/Pexels

Figure 2-6 A child's temperament can influence the nature of parent–child interactions.

Subsequent studies have noted that such characteristic patterns are generally stable and persist into adulthood (Tang et al., 2020). Some researchers suggest that the socialization process (i.e., parental responses, cultural expectations, peer relationships) may influence the way a child ultimately expresses these behaviors (Super et al., 2020; Wagers & Kiel, 2019). Maturation also plays a critical role in children's ability to exercise greater emotional control and respond in a more positive manner.

It is important to understand that temperament also affects the way in which a child experiences everyday activity. For example, a difficult child may be hard to please and react intensely or tantrum when things don't go his way. He may find it difficult to adjust to a new teacher or school and act out to express his displeasure. By contrast, an easy child may pout for a few minutes when told she can't have an ice cream cone, but then quickly turn her attention to the puppy playing in a neighbor's yard. A three-year-old who is slow-to-warm may require extra time to separate from his parents when they leave him at the preschool. In each case, it is easy to understand how a child's temperament may also influence the nature of an adult's response. Parents of difficult children may avoid situations that are likely to elicit an explosive outburst. In contrast, a smiling, easygoing toddler may invite unsolicited hugs and adult attention.

Categorical labels must be used cautiously when they are applied to children's behavior. Labeling a moody child as "difficult" or "slow-to-warm" may influence the expectations that an adult has for that child and reinforce the very behavior in question. For example, a slow-to-warm child may evoke few displays of affection from others. As a result, she may identify this as rejection, making it even more difficult for this child to act warm and outgoing.

Adult temperament must also be considered in this equation because it influences the way in which a child's behavior is perceived. For example, a short-fused parent may overreact to a curious toddler who continues to pull pots and pans from the cabinet despite an earlier warning, whereas an easygoing parent may understand that this is typical behavior and encourage the toddler's curiosity. In each case, adult temperament contributes to the contrast in perception and initial response to the toddler's behavior. Each reaction conveys an important message that continuously influences and shapes the child's behavior (Kälin & Roebers, 2021).

Gender Awareness and Identity

What does it mean to be a boy or a girl? Early in life, young children begin to develop a concept of gender and gender identity appropriate to their culture. Each boy and girl develops a set of behaviors, attitudes, beliefs, and commitments that are defined, directly or indirectly, as acceptable male or female attributes (McLean et al., 2020). In addition, children typically play out gender roles that reflect customary practices.

Several theoretical perspectives have been advanced over the years to explain children's gender identity formation. Freud's psychoanalytic theory suggested that children are initially attracted to the opposite-sex parent and later identify with the same-sex parent when they become sexually uncomfortable (Oedipus complex) (Freud, 1924). Most modern theorists do not agree with this concept. The social learning theory of gender advocates that children learn male or female behaviors through observation and imitation (Bandura, 1977), but critics consider this approach overly passive and suggest that it perpetuates male and female stereotyping.

Cognitive-developmental theorists believe that children play an active role (e.g., observing, imitating, and experiencing) in gender concept formation (Kohlberg, 1966). However, they also acknowledge maturational and biological differences (male/female) as influencing the way in which gender-relevant information is interpreted and internalized. Preferred-gender ideas are further socialized through continuous peer and adult feedback. For example, a five-year-old girl may be told to "act like a lady" or an eight-year-old boy may be chastised by his friends for choosing a girl to be on their kickball team.

Each theoretical approach has contributed to a contemporary understanding of gender and gender identity—that a child's sense of maleness or femaleness involves a complex interaction of biological, cognitive, and socialization processes, including cultural expectations, daily experiences, family values, adult role models, playmates and play opportunities, toys, and media exposure (Ristori et al., 2020; Shroeder & Liben, 2021).

Children's concept of gender is formed in stages. Infants, for example, are able to distinguish the difference between male and female voices and faces. Toddlers become aware of physical differences between boys and girls and begin to show a preference for same-sex playmates. Between two and three years of age, children are able to label themselves correctly as girls or boys. Their toy selections and play often reflect gender role stereotyping (e.g., mothers feed babies, while dads go to work) (Davis & Hines, 2020). Parents may begin treating children differently at this point—perhaps more tender and nurturing with girls, while reinforcing boys for their toughness and independent behaviors.

Gender stability is generally achieved by three to four years of age. That is, children distinguish themselves and others as being a boy or a girl based upon appearance: "Girls have long hair," "Boys have short hair"; "Girls wear pink, boys don't." However, they continue to believe that a person's gender can be changed depending upon the situation (Kohlberg, 1966). For example, a girl can become a "daddy" by simply dressing up in pants, T-shirt, and a hat. Three- and four-year-olds also begin labeling toys and activities as being either for girls or boys. Gender constancy becomes apparent between five and seven years of age. At this point, children accept that gender is permanent and unchangeable. It is important that children's gender identity be supported at each stage because it influences all aspects of development, including self-concept, self-esteem, academic performance, and mental health.

Children's sexual identity is usually well-established by middle childhood (Figure 2-7). Occasionally, a child may experience ideas and behaviors that do not necessarily conform to their assigned gender at birth (Diamond, 2020). They may identify more with another gender and struggle psychologically to accept (or even deny) their own sexuality. Adolescent boys are more likely than girls to feel significant parental and peer pressure to conform to gender-stereotyped norms. As a result, they tend to experience more behavioral problems, bullying, and psychological disorders when their behavior is nonconforming (van Beusekom et al., 2020).

Scientists have explored a number of factors, including genetic abnormalities, hormonal disturbances during fetal development, environmental influences, and