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## UNDERSTANDING HUMAN DEVELOPMENT: APPROACHES AND THEORIES



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Think back over your lifetime. How have you grown and changed over the years? Do your parents describe you as having been a happy baby? Were you fussy? What are some of your most vivid childhood memories? Were your adolescent years a stressful time? What types of changes do you expect to undergo in your adult years? Will you have a spouse? Will you have children? What career will you choose? How might these life choices and circumstances influence how you age and your perspective in older adulthood? Will your personality remain the same or change over time? In short, how will you change over the course of your lifespan?

### WHAT IS LIFESPAN HUMAN DEVELOPMENT?

#### LEARNING OBJECTIVE

- 1.1 Outline five principles of the lifespan developmental perspective.

This is a book about **lifespan human development**: how people grow, change, and stay the same throughout their lives, from conception to death. When people use the term *development*, they often mean the transformation from infant to adult. However, development does not end with adulthood. We continue to change in predictable ways throughout our lifetime, even into old age. Developmental scientists who study human development seek to understand these lifetime patterns of change.

We progress through many stages in life (see Table 1.1). The stages may have different labels and different sets of developmental tasks, but all have value and influence each other. The changes that we undergo during infancy, for instance, influence how we experience later changes, such as those during adolescence and beyond. Each stage of life is important and accompanied by its own demands and opportunities.

Change is perhaps the most obvious indicator of development. The muscle strength and coordination needed to play sports increases during childhood and adolescence, peaks in early adulthood, and begins to decline thereafter, declining more rapidly from middle to late adulthood (Gabbard, 2018). There also are ways in which we change little over our lifetimes. Some personality traits are highly stable over the lifespan, so that we remain largely the “same person” into old age (Schwaba & Bleidorn, 2018; Wortman et al., 2012).

**TABLE 1.1** ■ Stages in Human Development

Life Stage	Approximate Age Range	Description
Prenatal	Conception to birth	Shortly after conception, a single-celled organism grows and multiplies. This is the period of the most rapid physical development as basic body structures and organs form, grow, and begin to function.
Infancy and toddlerhood	Birth to 2 years	The newborn is equipped with senses that help it to learn about the world. Physical growth occurs and motor, perceptual, and intellectual skills develop. Children show advances in language comprehension, problem solving, self-awareness, and emotional control. They become more independent and interested in interacting with other children and form bonds with parents and others.
Early childhood	2 to 6 years	Children grow steadily, their muscles strengthen, and they become better at coordinating their bodies. Memory, language, and imagination improve. Children become more independent and better able to regulate their emotions. Family remains children’s primary social tie, but other children become more important and new ties to peers are established.
Middle childhood	6 to 11 years	Growth slows, but strength and athletic ability increase dramatically. Children show improvements in their ability to reason, remember, read, and use arithmetic. As children advance cognitively and gain social experience, they understand themselves in more complex ways compared with younger children. As friendships develop, peers and group memberships become more important.
Adolescence	11 to 18 years	Adolescents’ bodies grow rapidly. They become physically and sexually mature. Although some immature thinking persists, adolescents can reason in sophisticated and adultlike ways. Adolescents are driven to learn about themselves and begin the process of discovering who they are. Peer groups increase in importance.
Early adulthood	18 to 40 years	Physical condition peaks and then shows slight declines with time. Lifestyle choices play a large role in influencing health. Most young adults join the workforce, marry or establish a longterm bond with a spouse, and become parents. The timing of these transitions varies. Adolescents in Western industrialized societies often experience an extended transition to adulthood (called <b>emerging adulthood</b> ), spanning from ages 18 to 25 and as late as age 29.
Middle adulthood	40 to 65 years	In middle adulthood, people begin to notice changes in their senses, physical stamina, and sexuality. Basic mental abilities, expertise, and practical problem-solving skills peak. Career changes and family transitions require that adults continue to refine their understandings of themselves. Adults help children to become independent; then they adapt to an empty nest and assist elderly parents with their health and personal needs.
Late adulthood	65 years and beyond	Most older adults remain healthy and active. Reaction time slows, and although most older adults show a decline in some aspects of memory and intelligence, an increase in expertise and wisdom compensates for losses. Most older adult friendships are old friendships, and these tend to be very close and a source of support. Adults adjust to retirement, changes in health, and personal losses (such as the death of a loved one), as well as search for meaning in their lives.
Death		Death is a process that includes the stopping of heartbeat, circulation, breathing, and brain activity. A person’s death causes changes in his or her social context—family members and friends must adjust to and accept the loss.

Lifespan human development can be described by several principles. Development is (1) multidimensional, (2) multidirectional, (3) plastic, (4) influenced by multiple contexts, and (5) developmental science is multidisciplinary (Baltes et al., 2006; Overton & Molenaar, 2015).

### Development Is Multidimensional

Consider the many changes that mark each period of development and it is apparent that development is *multidimensional*. That is, development includes changes in multiple domains or areas of development. **Physical development** refers to body maturation and growth, such as body size, proportion, appearance, health, and perceptual abilities. **Cognitive development** refers to the maturation of thought processes and the tools that we use to obtain knowledge, become aware of the world around us, and solve problems. **Socioemotional development** includes changes in personality, emotions, views of oneself, social skills, and interpersonal relationships with family and friends. These areas of development overlap and interact. Brain maturation, a physical development, underlies advances in cognitive development, which enable adolescents to become better at understanding their best friend's point of view and to show more prosocial helpful behavior (Tamnes et al., 2018). In turn, adolescents become more empathetic and sensitive to their friends' needs and develop a more mature friendship, influencing socioemotional development (see Figure 1.1; Tamnes et al., 2018).

### Development Is Multidirectional

Development is commonly described as a series of improvements in performance and functioning, but in fact development is *multidirectional*, meaning that it consists of both gains and losses, growth and decline, throughout the lifespan (Baltes et al., 2006; Overton & Molenaar, 2015). Throughout life, there is a shifting balance between gains, or improvements in performance (common early in life), and losses, or declines in performance (common late in life; Baltes et al., 2006; Zacher et al., 2019). At all ages individuals can compensate for losses by improving existing skills and developing new ones (Boker, 2013). The speed at which people think tends to slow in late adulthood, but their increases in knowledge and experience enable older adults to compensate for the loss of speed when completing everyday tasks (Krampe & Charness, 2018; Margrett et al., 2010).

### Development Is Plastic

Development is characterized by **plasticity**: It is malleable, or changeable. Frequently the brain and body can compensate for illness and injury. In children who are injured and experience brain damage, other parts of the brain may take on new functions (Petranovich et al., 2020). Older adults who have experienced a decline in balance and muscle strength can regain and improve these capabilities through exercise (McAuley et al., 2013; Sañudo et al., 2019). Plasticity tends to decline as we age, but it does not disappear entirely. Plasticity makes it possible for individuals to adjust to change and to demonstrate **resilience**, the capacity to adapt effectively to adverse contexts and circumstances (Luthar et al., 2015; Masten, 2016).

**FIGURE 1.1** ■ Domains of Development

Advances in physical, cognitive, and socioemotional development interact, permitting children to play sports, learn more efficiently, and develop close friendships.



Source: iStock/ Essentials; iStock/ Signature; Jupiter/ Pixland/Thinkstock



Some plasticity is retained throughout life. Practicing athletic activities can help older adults rebuild muscle and improve balance.

Reuters/Mariana Bazo

## Development Is Influenced by Multiple Contexts

**Context** refers to where and when a person develops. Context encompasses many aspects of the physical and social environment, including family, neighborhood, country, and historical period. It includes intangible factors—characteristics that are not visible to the naked eye, such as values, customs, ideals, and culture. To understand individuals' development, we must look at their context, including the subtle, less easily perceived aspects.

Were you encouraged to be assertive and actively question the adults around you, or were you expected to be quiet and avoid confrontation? How large a part did spirituality or religion play in your family's life? Did it shape your parents' childrearing practices and your own values? How did your family's economic status affect your development? These questions examine the home context,

critical for our development. We are also embedded in other contexts that influence us and that we influence, such as peer group, school, neighborhood or community, and culture. Our development occurs within the contexts in which we live, a theme that we will return to throughout this book.

### Sociohistorical Context

The multitude of contextual factors that interact over the life course can be organized into three categories: age-graded influences, history-graded influences, and nonnormative influences (Elder & George, 2016; Elder et al., 2016).

*Age-graded influences* are closely tied to chronological age and are largely predictable. Most individuals walk when about 1 year old and reach puberty in early adolescence. Similarly, most women reach menopause in their late 40s or early 50s. Age-graded influences tend to be most influential early and late in life. Although these influences are often tied to biology, social milestones can also form age-graded influences. Most people in the United States enter school at about 5 years of age, graduate from high school and enter college at about age 18, and retire during their 60s. Some age-graded influences are context-dependent. Adolescents in suburban and rural contexts commonly get driver's licenses at age 16, but this may not be true of adolescents in urban settings where driving may be less common.

The term *history-graded influence* refers to how the time in which we live and the unique historical circumstances of that period affect our development. History-graded influences include wars, epidemics, advances in science and technology, and economic shifts such as periods of depression or prosperity (Baltes, 1987). For instance, the COVID-19 pandemic shaped individuals' health behaviors, such as wearing face coverings, standing further away from others, and refraining from handshakes and hugs. School closures during the pandemic posed risks to children's and adolescents' academic and social development as well as their mental health (Golberstein et al., 2020; Lee, 2020). Even temporary changes such as these are contextual influences that shape our world and our development. The effect of historical events on development depends in part on when they occur in a person's life (Elder et al., 2015). Older adults may experience the COVID pandemic differently than younger people, given their lifelong experiences as well as their heightened risk for infection (Pfefferbaum & North, 2020). For many older adults, the pandemic is a period of great loneliness.



The COVID-19 pandemic is an example of a sociohistorical influence that contributes to cohort, or generational, differences in development.

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Contextual influences tied to specific historical eras explain why generations, such as "Baby Boomers" and "Millennials," differ from each other. A generation is also known as a **cohort** (a group of people born around the same time). Members of a cohort are similar in ways that people born at other times are not. For example, adults who came of age during the Great Depression and World War II tend to have particularly strong views on the importance of the family, civic-mindedness, and social connection (Rogler, 2002).

Take a moment to think about what role larger historical events have played in your development. Consider the Black Lives Matter Movement, begun in 2013; the legalization of same-sex marriage in the United States in 2015; the school shooting in Newtown, Connecticut in 2012; the election of the first African American president of the United States in 2008; and the terrorist attacks of September 11, 2001. How have historical events influenced you and those around you? Can you identify ways in which, because of historical events, your cohort may differ from your parents' cohort? Your grandparents' cohort?

Whereas age-graded and history-graded influences are common to all people, or all members of a cohort, individuals also have experiences that are unique to them. *Nonnormative influences* are experiences or events that happen to a person or a few people. Nonnormative influences include experiencing the death of a parent in childhood, widowhood in early adulthood, winning the lottery, or illness. Nonnormative events are not predictable and are not easily studied, as they are not experienced by most people—and the nature of nonnormative events varies widely. With age, nonnormative influences become more powerful determinants of development.

### Cultural Context

Like sociohistorical context, the cultural context is a broad influence on the development of all people at all ages in life. **Culture** refers to a set of customs, knowledge, attitudes, and values that are shared by members of a group and are learned early in life through interactions with group members (Markus & Kitayama, 1991). We are immersed in culture, which influences all of our contexts and includes the processes used by people as they make meaning or think through interactions with group members (Mistry et al., 2016; Yoshikawa et al., 2016).

Development varies dramatically with cultural context (Keller, 2017). The cultural context in which individuals live influences the timing and expression of many aspects of their development, even physical developments such as walking, which was long thought to be a matter of biological maturation (Mistry, 2013). In Uganda, infants begin to walk at about 10 months of age, in France at about 15 months, and in the United States at about 12 months. These differences are influenced by parenting practices that vary by culture. African parents tend to handle infants in ways that stimulate walking, by playing games that allow infants to practice jumping and walking skills (Hopkins & Westra, 1989; Super, 1981).

Development and culture are fused and mutually interact, with culture inherent in all **domains of development** and a contributor to the context in which we are embedded, transmitting values, attitudes, and beliefs that shape our thoughts, beliefs, and behaviors (Mistry & Dutta, 2015). There are many cultures, or subcultures, within each society (Oyserman, 2016, 2017). North American culture is not homogeneous; many subcultures exist, defined by factors such as ethnicity (e.g., African American, Asian American), religion (e.g., Christian, Muslim), geography (e.g., southern, midwestern), and others, as well as combinations of these factors.

### Developmental Science is Multidisciplinary

Psychologists, sociologists, anthropologists, biologists, neuroscientists, and medical researchers all conduct research that is relevant to understanding aspects of human development. Consider cognitive development. Children's performance on cognitive measures, such as problem solving, is influenced by their physical health and nutrition (Anjos et al., 2013; Biddle et al., 2019), interactions with peers (Holmes et al., 2016), and neurological development (Stiles et al., 2015), findings from the fields of medicine, psychology, and neuroscience, respectively. To understand how people develop at all periods in life, developmental scientists must combine insights from all of these disciplines.

### Thinking in Context: Lifespan Development

1. Describe your own development. Provide personal examples that illustrate the multidimensional nature of your own development. In what ways has your development illustrated multidirectionality? Plasticity?
2. Consider the societal and cultural events that your parents may have experienced in their youth. What technology was available? What historical events did they experience? What were the popular fads of their youth? What influence do you think these sociohistorical factors may have had on your parents' development? Compare their sociohistorical context with the one in which you were raised. What historical and societal events may have influenced you? What events have shaped your generation?
3. Consider your own experiences with culture. With which culture or subculture do you identify? How much of a role do you think your cultural membership has had in your development?
4. Why might some people say that the U.S. has no culture? What do you think?

## BASIC ISSUES IN LIFESPAN HUMAN DEVELOPMENT

### LEARNING OBJECTIVE

- 1.2 Explain three basic issues in developmental science.

Developmental scientists agree that people change throughout life and show increases in some capacities and decreases in others from conception to death. Yet they sometimes disagree about how development proceeds and what causes developmental changes. Developmental scientists' explanations of how people grow and change over their lives are influenced by their perspectives on three basic issues, or fundamental questions, about human development:

- (1) Do people change gradually, often imperceptibly, over time, or is developmental change sudden and dramatic?
- (2) What role do people play in their own development? How much are they influenced by their surroundings, and how much do they influence their surroundings?
- (3) To what extent is development a function of inborn genetic characteristics, and to what extent is it affected by the environment in which individuals live?

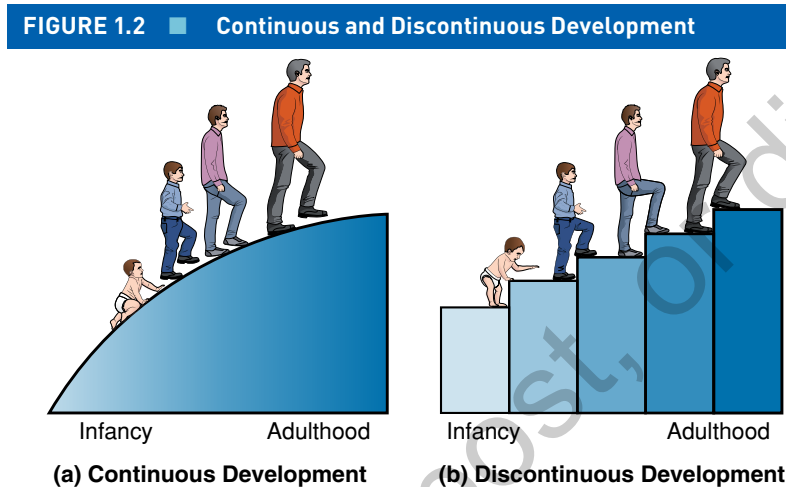
The following sections examine each of these questions.

### Development Is Characterized by Continuous and Discontinuous Change

Do children slowly grow into adults, steadily gaining more knowledge and experience and becoming better at reasoning? Or do they grow in spurts, showing sudden, large gains in knowledge and reasoning capacities? Some aspects of development unfold slowly and gradually over time, demonstrating **continuous change**. For example, children slowly gain experience and learn strategies to become quicker at problem solving (Siegler, 2016). Similarly, middle-aged adults experience gradual losses of muscle and strength (Keller & Engelhardt, 2013). Others aspects of development are best described as **discontinuous change**, characterized by abrupt change, with individuals of various ages dramatically different from one another. Puberty transforms children's bodies into more adult-like adolescent bodies (Wolf & Long, 2016), infants' understanding and capacity for language is qualitatively different from that of school-aged children (Rudman & Titjen, 2018), and children make leaps in their reasoning

abilities over the course of childhood, such as from believing that robotic dogs and other inanimate objects are alive to understanding that life is a biological process (Beran et al., 2011; Zaitchik et al., 2014). As shown in Figure 1.2, a discontinuous view of development emphasizes sudden transformation, whereas a continuous view emphasizes gradual and steady changes.

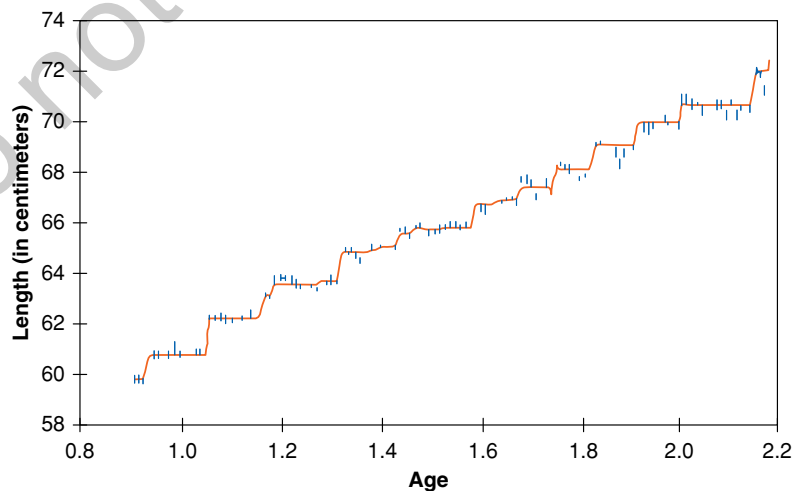
It was once believed that development was either continuous or discontinuous, but not both. Today, developmental scientists agree that development includes both continuity and discontinuity (Lerner et al., 2014). Whether a particular developmental change appears continuous or discontinuous depends, in part, on our point of view. Consider physical growth. We often think of increases in height as involving a slow and steady process; each month, an infant is taller than the prior month, illustrating continuous change. However, as shown in Figure 1.3, when researchers measured infants' height every day, they discovered that infants have growth days and nongrowth days—days in which they show rapid change in height interspersed with days in which there is no change in height—illustrating



Adapted from End of the Game (2014) Child Development 101 – History and Theory, <https://endofthegame.net/2014/04/15/child-development-101-history-and-theory/3/>

**FIGURE 1.3** ■ Infant Growth: A Continuous or Discontinuous Process

Infants' growth occurs in a random series of roughly 1-centimeter spurts in height that occur over 24 hours or less. The overall pattern of growth entails increases in height, but whether the growth appears to be continuous or discontinuous depends on our point of view.



Source: Lampl et al [1992].

discontinuous change (Lampl et al., 2001). In this example, monthly measurements of infant height suggest gradual increases, but daily measurements show spurts of growth, each lasting 24 hours or less. Thus, whether a given phenomenon, such as height, is described as continuous or discontinuous depends on perspective. Most developmental scientists agree that some aspects of development are best described as continuous and others as discontinuous (Miller, 2016).

### Individuals Are Active in Development

Do people have a role in influencing how they change over their lifetimes? That is, are people active in influencing their own development? Taking an active role means that they interact with and influence the world around them, create experiences that lead to developmental change, and thereby influence how they change over the lifespan. Alternatively, if individuals take a passive role in their development, they are shaped by, but do not influence, the world around them.

The prevailing view among developmental scientists is that people are active contributors to their own development (Lerner et al., 2014; Overton, 2015). People are influenced by the physical and social contexts in which they live, but they also play a role in influencing their development by interacting with, and changing, those contexts (Elder et al., 2016). Even infants influence the world around them and construct their own development through their interactions. Baby Joey smiles at each adult he passes by as his mother pushes his stroller in the park. Adults often respond with smiles, use “baby talk,” and make faces. Baby Joey’s actions, even simple smiles, influence adults, bringing them into close contact, making one-on-one interactions and creating opportunities for learning. By engaging the world around them, thinking, being curious, and interacting with people and objects, infants and children are “manufacturers of their own development” (Flavell, 1992, p. 998). That is, they play an active role in influencing their own development.

### Nature and Nurture Influence Development

Perhaps the oldest question about development concerns its origin. Researchers once asked whether development is caused by nature (genetics) or nurture (environment), a question referred to as the **nature-nurture debate**. Explanations that relied on nature pointed to inborn genetic traits and maturational processes as causes of developmental change. For example, most infants take their first steps at roughly the same age, suggesting a maturational trend that supports the role of nature in development (Payne & Isaacs, 2016). An alternative explanation for developmental change emphasized nurture—the environment. Although most infants begin to walk at about the same time, environmental conditions can speed up or slow down the process. Infants who experience malnutrition may walk later than

well-nourished infants, and those who are given practice making stepping or jumping movements may walk earlier (Siekerman et al., 2015; Worobey, 2014). In other words, infants may walk at about the same time because they experience similar environmental circumstances and parenting practices.

Today, the nature-nurture debate is, in fact, not a debate. Instead, most developmental scientists now agree that *both* nature and nurture are important contributors to development, and the question has changed to how do genetics and environment work together to influence child development (Rutter, 2014; Sasaki & Kim, 2017). Thus, walking is heavily influenced by maturation (nature), but experiences and environmental conditions can speed up or slow down the process (nurture). Now developmental scientists are attempting to determine *how* nature and nurture interact and work together to influence how people grow and change throughout life (Bjorklund, 2018b; Lickliter & Witherington, 2017).



It's easy to see how this baby can influence the world around her and construct her own development through her interactions. By smiling at each adult she sees, she influences her world because adults are likely to smile, use “baby talk,” and play with her in response.

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### Thinking in Context: Lifespan Development

1. Identify ways in which you have changed very gradually over the years. Have there been times when you showed abrupt change, such as in physical growth, strength and coordination, thinking abilities, or social skills? In other words, in what ways is your development characterized by continuity? Discontinuity?
2. Provide examples of how a child might play an active role in his or her development. How do children influence the world around them?

### Thinking in Context: Biological Influences

1. How is nature and nurture reflected in your own development? What traits, abilities, or behaviors do you believe are influenced by inborn factors? What role did the physical and social environment play in your development?
2. Consider similarities and differences among your family members. How might they reflect the interaction of nature and nurture?

## THEORETICAL PERSPECTIVES ON HUMAN DEVELOPMENT

### LEARNING OBJECTIVE

- 1.3 Summarize five theoretical perspectives on human development.

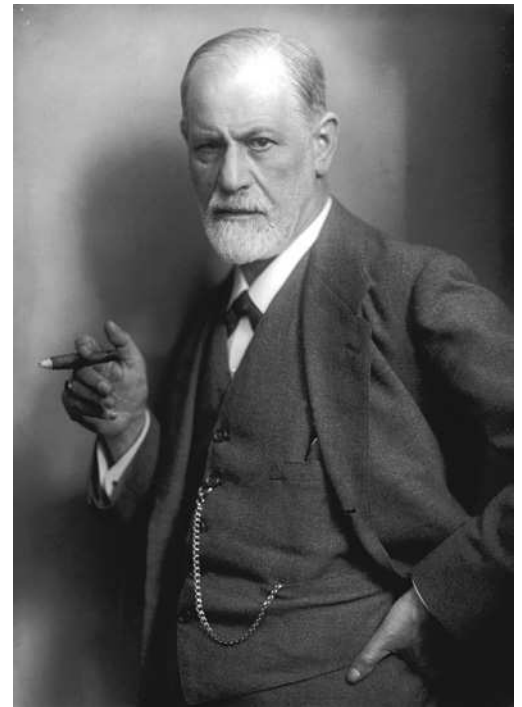
Over the past century, scientists have learned much about how individuals progress from infants, to children, to adolescents, and to adults, as well as how they change throughout adulthood. The great body of research in the field of lifespan human development has been organized into several theoretical perspectives to account for the developmental changes that occur over the lifespan.

### Psychoanalytic Theories

**Psychoanalytic theories** describe development and behavior as a result of the interplay of inner drives, memories, and conflicts we are unaware of and cannot control. Freud and Erikson are two key psychoanalytic theorists.

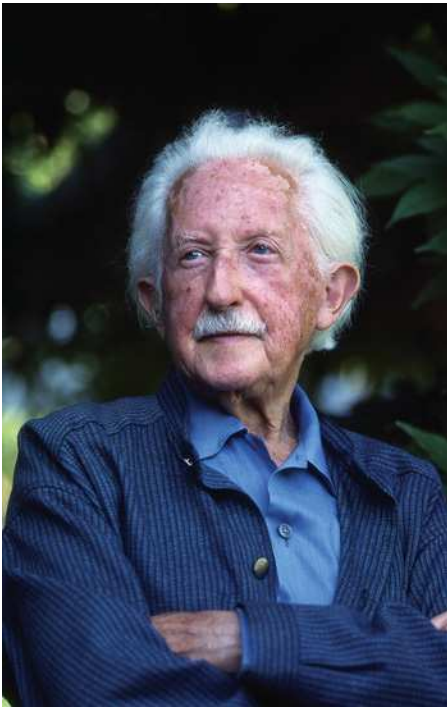
#### Freud's Psychosexual Theory

Sigmund Freud (1856–1939), a Viennese physician, believed that much of our behavior is driven by unconscious impulses (impulses that are outside of our awareness). He described development as the progression through a series of *psychosexual stages*, periods in which unconscious drives are focused on different parts of the body, making stimulation to those parts a source of pleasure. Freud explained that the task for parents is to strike a balance between overgratifying and undergratifying a child's desires at each stage, to help the child develop a healthy personality with the capacity for mature relationships throughout life. Notably, Freud did not study children; his **theory** grew from his work with female psychotherapy patients (Crain, 2016). Today Freud's ideas about psychosexual development and emphasis on childhood sexuality are unpopular and not widely accepted (Westen, 1998). In addition, it is not possible to conduct research examining Freud's ideas because unconscious drives and other psychosexual constructs cannot be directly observed and tested (Miller, 2016).



Sigmund Freud (1856–1939), the father of the psychoanalytic perspective, believed that much of our behavior is driven by unconscious impulses.

Library of Congress



Erik Erikson (1902–1994) posited that, throughout their lives, people progress through eight stages of psychosocial development.

Jon Erikson/Science Source

## Erikson's Psychosocial Theory

Erik Erikson (1902–1994) was influenced by Freud, but he placed less emphasis on unconscious motivators of development and instead focused on the role of the social world, society, and culture (see Table 1.2). According to Erikson, throughout their lives, individuals progress through eight *psychosocial stages* that include changes in how they understand and interact with others, as well as changes in how they understand themselves and their roles as members of society (Erikson, 1950). Each stage presents a unique developmental task, which Erikson referred to as a crisis or conflict that must be resolved. How well individuals address the crisis determines their ability to deal with the demands made by the next stage of development. For example, children's success in achieving a sense of trust in others influences their progress in developing a sense of autonomy, the ability to be independent and guide their own behavior.

Regardless of their success in resolving the crisis of a given stage, individuals are driven by biological maturation and social expectations to the next psychosocial stage. No crisis is ever fully resolved, and unresolved crises are revisited throughout life. Although Erikson believed that it is never too late to resolve a crisis, resolving a crisis from a previous stage may become more challenging over time as people focus on current demands and the crises of their current psychosocial stages.

Erikson's theory includes the role of society and culture, largely ignored by Freud. Erikson based his theory on a broad range of cases, including larger and more diverse samples of people than did Freud. Erikson's theory is criticized as difficult to test because many crises are not easily observed. It has nonetheless sparked research on specific stages, such as the development of identity during adolescence (Crain, 2016). Erikson's lifespan theory of development holds implications for every period of life. We will revisit his theory throughout this book.

**TABLE 1.2** ■ Psychoanalytic Theories of Development

Approximate Age	Freud's Psychosexual Theory		Erikson's Psychosocial Theory	
0 to 18 months	Oral	Basic drives focus on the mouth, tongue, and gums. Feeding and weaning influence personality development. Failure to meet oral needs influences adult habits centering on the mouth (such as fingernail biting, overeating, smoking, excessive drinking).	Trust vs. Mistrust	Infants learn to trust that others will fulfill their basic needs (nourishment, warmth, comfort) or to lack confidence that their needs will be met.
18 months to 3 years	Anal	Basic drives are oriented toward the anus, and toilet training is an important influence on personality development. If caregivers are too demanding or too lax, individuals may develop issues of control such as a need to impose extreme order and cleanliness on their environment or extreme messiness and disorder.	Autonomy vs. Shame and Doubt	Toddlers learn to be self-sufficient and independent through toilet training, feeding, walking, talking, and exploring or to lack confidence in their own abilities and doubt themselves.
3 to 6 years	Phallic	In Freud's most controversial stage, basic drives shift to the genitals. The child develops a romantic desire for the opposite-sex parent and a sense of hostility and/or fear of the same-sex parent. The conflict between the child's desires and fears arouses anxiety and discomfort. It is resolved by pushing the desires into the unconscious and spending time with the same-sex parent and adopting his or her behaviors and roles, adopting societal expectations and values. Failure to resolve this conflict may result in guilt and a lack of conscience.	Initiative vs. Guilt	Young children become inquisitive, ambitious, and eager for responsibility or experience overwhelming guilt for their curiosity and overstepping boundaries.

Approximate Age	Freud's Psychosexual Theory		Erikson's Psychosocial Theory	
6 years to puberty	Latency	This is not a stage but a time of calm between stages when the child develops talents and skills and focuses on school, sports, and friendships.	Industry vs. Inferiority	Children learn to be hard working, competent, and productive by mastering new skills in school, friendships, and home life or experience difficulty, leading to feelings of inadequacy and incompetence.
Adolescence	Genital	With the physical changes of early adolescence, the basic drives again become oriented toward the genitals. The person becomes concerned with developing mature adult sexual interests and sexual satisfaction in adult relationships throughout life.	Identity vs. Role Confusion	Adolescents search for a sense of self by experimenting with roles. They also look for answers to the question, "Who am I?" in terms of career, sexual, and political roles or remain confused about who they are and their place in the world.
Early adulthood			Intimacy vs. Isolation	Young adults seek companionship and a close relationship with another person or experience isolation and self-absorption through difficulty developing intimate relationships and sharing with others.
Middle adulthood			Generativity vs. Stagnation	Adults contribute to, establish, and guide the next generation through work, creative activities, and parenting or stagnate, remaining emotionally impoverished and concerned about themselves.
Late adulthood			Integrity vs. Despair	Older adults look back at life to make sense of it, accept mistakes, and view life as meaningful and productive or feel despair over goals never reached and fear of death.

## Behaviorist and Social Learning Theories

In response to psychoanalytic theorists' emphasis on the unconscious as an invisible influence on development and behavior, some scientists pointed to the importance of studying observable behavior rather than thoughts and emotion, which cannot be seen or objectively verified. Theorists who study **behaviorism** examine only behavior that can be observed and believe that all behavior is influenced by the physical and social environment. Consider this famous quote from John Watson (1925), a founder of behaviorism:

Give me a dozen healthy infants, well formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant, chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. (p. 82)

Watson believed that by controlling an infant's physical and social environment, he could control the child's destiny. Behaviorist theory is also known as *learning theory* because it emphasizes how people and animals learn new behaviors as a function of their environment.

### Operant Conditioning

Perhaps it is human nature to notice that the consequences of our behavior influence our future behavior. A teenager who arrives home after curfew and is greeted with a severe scolding may be less likely to return home late in the future. A child who is praised for setting the dinner table may be more likely to spontaneously set the table in the future. These two examples illustrate the basic tenet of B. F. Skinner's (1905–1990) theory of operant conditioning, which holds that behavior becomes more or less probable depending on its consequences. According to Skinner, a behavior followed by a rewarding or pleasant outcome, called **reinforcement**, will be more likely to recur, but one followed by an aversive or unpleasant outcome, called **punishment** will be less likely to recur.



In a classic study conducted by Albert Bandura, children who observed an adult playing with a bobo doll toy roughly imitated those behaviors, suggesting that children learn through observation.

Mirrorpix/Contributor/Getty Images

Operant conditioning explains how we learn skills and habits, but developmental scientists tend to disagree with operant conditioning's emphasis on external events (reinforcing and punishing consequences) over internal events (thoughts and emotions) as influences on behavior (Crain, 2016). Controlling people's environments can influence their development, but change can also occur from within, through people's own thoughts and actions. Children, adolescents, and adults can devise new ideas and learn independently without experiencing reinforcement or punishment, consistent with the lifespan concept that individuals are active contributors to their development.

### Social Learning Theory

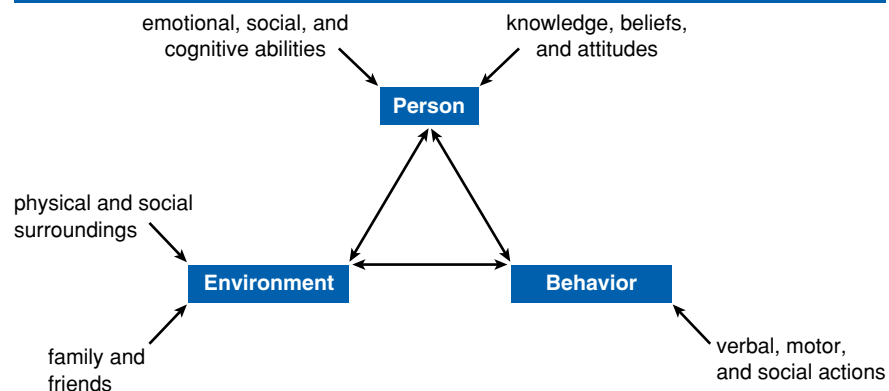
Like behaviorists, Albert Bandura (1925–2021) believed that the physical and social environments are important, but he also advocated for thought and emotion as contributors to development. According to Bandura's **social learning theory**, people actively process information—they think and they feel emotion—and their thoughts and feelings influence their behavior. The physical and social environments influence our behavior through their effect on our thoughts and emotions. We can learn by thinking about the potential consequences of our actions. Teenagers who break their curfew and are met by worried parents may experience remorse, and remorse may make them less likely to come home late in the future. We do not need to experience punishment or reinforcement to change our behavior (Bandura, 2012).

One of Bandura's most enduring ideas about development is that people learn by observing the consequences of others' actions, which he referred to as **observational learning** (Bandura, 2010). Children who observe violence rewarded, such as a child grabbing (and successfully obtaining) another child's toy, may imitate what they see and use aggressive means to take other children's toys. A child observer might be less likely to imitate a child who takes another child's toy if the aggressor is scolded by a teacher and placed in time out.

Bandura also contributed to the field of lifespan human development with his concept of **reciprocal determinism**, according to which individuals and the environment interact and influence each other (Bandura, 2011, 2018). Bandura viewed individuals as active in their development because development is a result of interactions between the individual's characteristics, his or her behavior, and the physical and social environment (see Figure 1.4).

People's characteristics influence their behavior and the environments they seek. Their environments also influence their characteristics. Personal characteristics (e.g., inquisitiveness) influence behavior (e.g., asking lots of questions), which influences the environment (e.g., receiving interesting responses from other people). Those responses, in turn, influence behavior (asking questions and further engaging others) and personal characteristics (increasing or decreasing inquisitiveness).

**FIGURE 1.4** ■ Bandura's Model of Reciprocal Determinism



Concepts such as observational learning, reinforcement, and punishment are powerful means of explaining human behavior and hold implications for parents, teachers, and anyone who works with people of any age. Social learning theory and reciprocal determinism illustrate the role that individuals play in their own development, a more complex explanation for development and behavior. We will revisit these concepts in later chapters.

## Cognitive Theories

Cognitive theorists view cognition (thought) as essential to understanding people's functioning across the lifespan.

### Piaget's Cognitive-Developmental Theory

Swiss scholar Jean Piaget (1896–1980) was the first scientist to systematically examine infants' and children's thinking and reasoning. Piaget believed that to understand children, we must understand how they think because thinking influences all behavior. Piaget's **cognitive-developmental theory** views children and adults as active explorers of their world, driven to learn by interacting with the world around them and organizing what they learn, thereby contributing to their own cognitive development.

Piaget proposed that children's drive to explore and understand the world propels them through four stages of cognitive development (see Table 1.3). His concept of cognitive stages and the suggestion that children's reasoning is limited by their stage has implications for education—specifically, the idea that effective instruction must match the child's developmental level.



Jean Piaget (1896–1980) believed that children's drive to explore and understand the world around them propels them through four stages of cognitive development.

Bill Anderson/Science Source

### Information Processing Theory

According to **information processing theory**, the mind works in ways similar to a computer in that information enters and then is manipulated, stored, recalled, and used to solve problems (Halford & Andrews, 2011). Unlike the theories we have discussed thus far, information processing theory is not one theory that is attributed to an individual theorist. Instead, there are many information processing theories, and each emphasizes a different aspect of thinking (Callaghan & Corbit, 2015; Müller et al., 2015; Ristic & Enns, 2015). Some theories focus on how people perceive, focus on, and take in information. Others examine how people store information, create memories, and remember information. Still others examine problem solving—how people approach and solve problems in school, the workplace, and everyday life.

**TABLE 1.3** ■ Piaget's Stages of Cognitive Development

Stage	Approximate Age	Description
Sensorimotor	Birth to 2 years	Infants understand the world and think using only their senses and motor skills, by watching, listening, touching, and tasting.
Preoperations	2 to 6 years	Preschoolers explore the world using their own thoughts as guides and develop the language skills to communicate their thoughts to others. Despite these advances, their thinking is characterized by several errors in logic.
Concrete Operations	7 to 11 years	School-aged children become able to solve everyday logical problems. Their thinking is not yet fully mature because they are able to apply their thinking only to problems that are tangible and tied to specific substances.
Formal Operations	12 years to adulthood	Adolescents and adults can reason logically and abstractly about possibilities, imagined instances and events, and hypothetical concepts.



Lev Vygotsky (1896–1934) emphasized the importance of culture in development. Children actively engage their social world, and the social world shapes development by transmitting culturally relevant ways of thinking and acting that guide children's thought and behavior.

Heritage Image Partnership Ltd/Alamy Stock Photo

According to information processing theorists, we are born with the ability to process information. Our mental processes of noticing, taking in, manipulating, storing, and retrieving information do not show the radical changes associated with stage theories. Instead, development is continuous or gradual. We become more efficient at attending to, storing, and processing information during the childhood years and these processes tend to slow during the adult years (Luna et al., 2015). Brain maturation contributes to changes in our information processing abilities. Experience and interaction with others also contributes by helping us learn new ways of managing and manipulating information.

### Contextual Theories

Contextual theories emphasize the role of the sociocultural context in development. Recall that people of all ages are immersed in a system of social contexts and are inseparable from the cultural beliefs and societal, neighborhood, and familial contexts in which they live.

### Vygotsky's Sociocultural Theory

Writing at the same time as Piaget, Russian scholar Lev Vygotsky (1896–1934) offered a different perspective on development, especially cognitive development, that emphasized the importance of culture. Recall that culture refers to the beliefs, values, customs, and skills of a group; it is a product of people's interactions in everyday settings (Markus & Kitayama, 2010). Vygotsky's (1978) **sociocultural theory** examines how culture is transmitted from one generation to the next through social interaction. Children interact with adults and more experienced peers as they talk, play, and work alongside them. Through these formal and informal dialogues, children learn about their culture and adopt their culture's perspectives and practices, learning to think and behave as members of their society (Rogoff, 2016). Over time, they become able to apply these ways of thinking to guide their own actions, thus requiring less assistance from adults and peers (Rogoff et al., 2014).

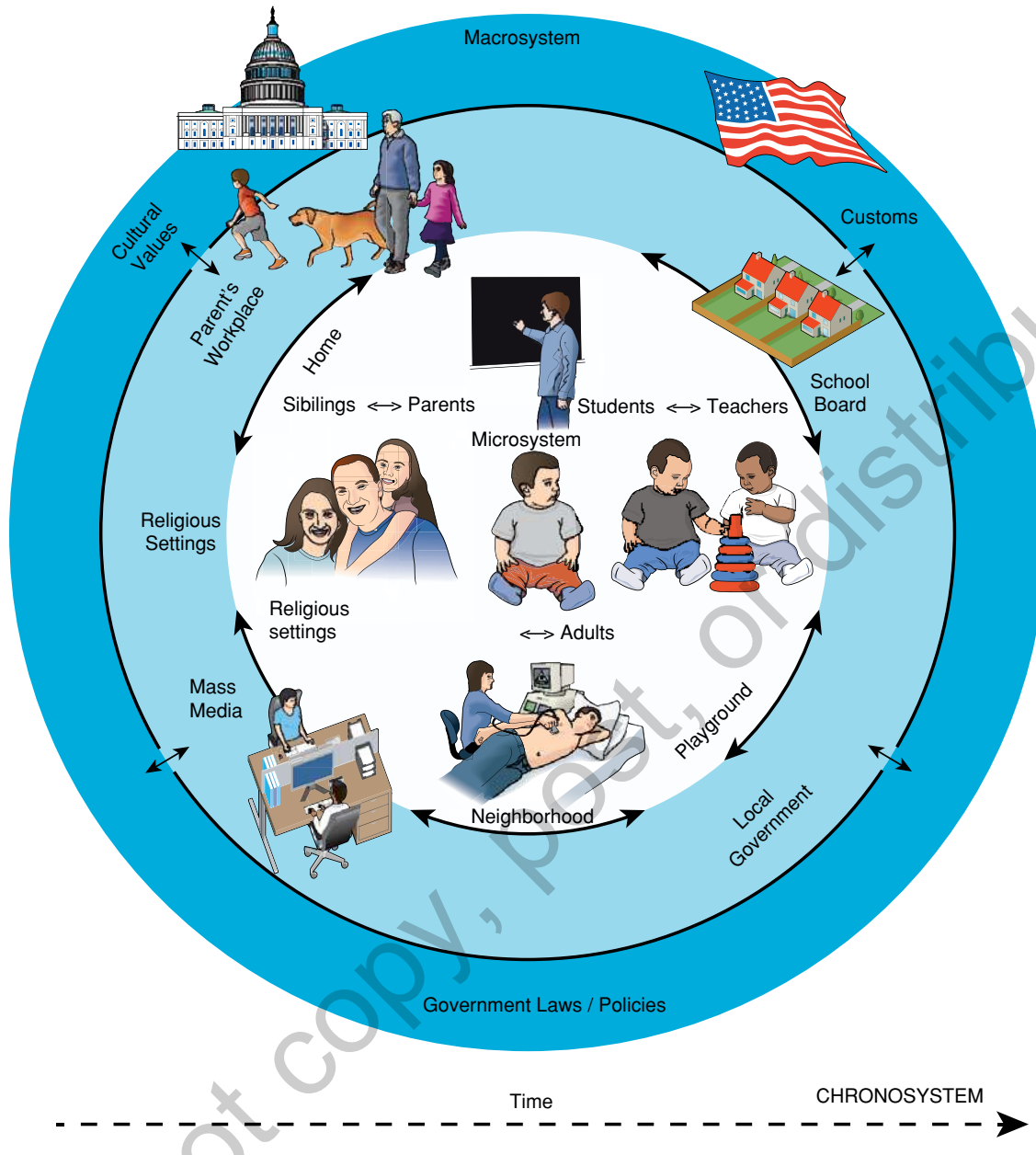
Like Piaget, Vygotsky emphasized that children actively participate in their development by engaging with the world around them. However, Vygotsky also viewed cognitive development as a social process that relies on interactions with adults, more mature peers, and other members of their culture.

### Bronfenbrenner's Bioecological Systems Theory

Similar to Vygotsky, Urie Bronfenbrenner (1917–2005) believed that individuals are active in their own development. Bronfenbrenner's **bioecological systems theory** posits that development is a result of the ongoing interactions among biological, cognitive, and socioemotional changes within individuals and their changing contexts, including home, school, neighborhood, culture, and society (see Figure 1.5) (Bronfenbrenner & Morris, 2006). Bronfenbrenner proposed that all individuals are embedded in, or surrounded by, a series of contexts: home, school, neighborhood, culture, and society. Contexts are organized into a series of systems in which individuals are embedded and that interact with one another and the person to influence development.

At the center of the bioecological model is the individual. **Ontogenetic development** refers to the changes that take place within individuals' interacting biological, cognitive, and socioemotional traits. Physical development, such as brain maturation, may influence children's cognitive development, such as reasoning and the ability to consider other people's perspectives, which in turn may influence social development, such as the ability to have more complex and intimate friendships. Social development can then influence cognitive development, as children learn from each other. Ontogenetic development is influenced by, but also influences, the many contexts in which we are embedded (Bronfenbrenner & Morris, 2006).

FIGURE 1.5 ■ Bronfenbrenner's Bioecological Systems Theory



Source: Adapted from Bronfenbrenner and Morris (2006).

Perhaps the most visible context is the **microsystem**, the innermost level of the bioecological system, which includes interactions with the immediate physical and social environment surrounding the person, such as family, peers, school, and work. Because the microsystem contains the developing person, it has an immediate and direct influence on his or her development. Peer relationships can influence a person's sense of self-esteem, social skills, and emotional development.

Microsystems naturally interact. Experiences in the home (one microsystem) influence those at school (another microsystem). These interactions comprise the **mesosystem**, which refers to the relations among microsystems or connections among contexts, such as home, peer group, school, work, and neighborhood. Like the microsystem, the mesosystem has a direct influence on the individual because he or she is a participant in it.

The **exosystem** consists of settings in which the individual is not a participant but that nevertheless influence him or her. The availability of funding for schools, an exosystem factor, indirectly

affects children by influencing the availability of classroom resources. The exosystem illustrates how the effects of outside factors trickle down and indirectly affect individuals.

The **macrosystem** is the greater sociocultural context in which the microsystem, mesosystem, and exosystem are embedded. It includes cultural values, legal and political practices, and other elements of the society at large. The macrosystem indirectly influences the child because it affects each of the other contextual levels. Cultural beliefs about the value of education (macrosystem) influence funding decisions made at national and local levels (exosystem), as well as what happens in the classroom and in the home (mesosystem and microsystem).

By its very nature, the bioecological model is always shifting because individuals and their contexts interact dynamically and perpetually, resulting in a constant state of change. The final element of the bioecological system is the **chronosystem**, which refers to the element of time. The bioecological system changes over time and the time in which we live influences our development. Large-scale social changes, such as those that accompany war, natural disasters, and epidemics, can influence each level of the bioecological system. Neighborhood resources may change over time with changes in local policies and funding. Our relationships with parents, friends, and teachers change over time. As people grow and change, they take on and let go of various roles, such as student, employee, parent, and grandparent. These shifts in contexts, called *ecological transitions*, occur throughout life.

Recently, the bioecological model has been criticized for its vague explanation of culture as being part of the macrosystem (Vélez-Agosto et al., 2017). Current views of culture describe it as all the processes used by people in their daily activities as they make meaning or think through interactions with group members (Mistry et al., 2016; Vélez-Agosto et al., 2017; Yoshikawa et al., 2016). Cultural influences operate at each ecological level, not simply the macrosystem as Bronfenbrenner believed (Varnum & Grossmann, 2017).

A second criticism arises from the sheer complexity of the bioecological model and its attention to patterns and dynamic interactions. We can never measure and account for all of the potential individual and contextual influences on development at once, making it difficult to devise research studies to test the validity of the model. In any case, bioecological theory remains an important contribution to explaining developmental change across the lifespan and is a theory that we will consider throughout this book.

### Ethology and Evolutionary Developmental Theory

**Ethology** is the scientific study of the evolutionary basis of behavior (Bateson, 2015). In 1859, Charles Darwin proposed his theory of evolution, explaining that all species adapt and evolve over time. Traits that enable a species to adapt, thrive, and mate tend to be passed to succeeding generations because they improve the likelihood of the individual's and species' survival. Several early theorists applied the concepts of evolution to behavior. Konrad Lorenz and Kiko Tinbergen, two European zoologists, observed animal species in their natural environments and noticed patterns of behavior that appeared to be inborn, emerged early in life, and ensured the animals' survival. For example, shortly after birth, goslings imprint to their mother, meaning that they bond to her and follow her. Imprinting aids the goslings' survival because it ensures that they stay close to their mother, get fed, and remain protected. Mothers instinctively stay close to the nest so that their young can imprint (Lorenz, 1952).

John Bowlby (1969) believed that humans also display biologically preprogrammed behaviors that have survival value and promote development. Crying, smiling, and grasping are inborn ways that infants get attention from caregivers as caregivers naturally respond to these cues, ensuring that infants will be safe and cared for. These behaviors have adaptive significance because they meet infants' needs and promote the formation of bonds with caregivers, ensuring that the caregivers will feel a strong desire and obligation to care for them (Bowlby, 1973). In this way, innate biological drives and behaviors work together with experience to influence adaptation and, ultimately, an individual's survival.

Another theory, **evolutionary developmental theory**, applies principles of evolution and scientific knowledge about the interactive influence of genetic and environmental mechanisms to understand the changes people undergo throughout their lives (Bjorklund, 2018a; Witherington & Lickliter,



2016). From an evolutionary development perspective, genes and context interact in an ever-changing way so that it is impossible to isolate the contributions of each to development (Witherington & Lickliter, 2016). Although all of our traits and characteristics are influenced by genes, contextual factors influence the expression of genetic instructions, determining whether and how genes are shown. Contextual factors such as gravity, light, temperature, and moisture can influence how genes are expressed and therefore how individuals develop (Meaney, 2017). For instance, in some reptiles, such as crocodiles, sex is determined by the temperature at which the organism develops. Eggs incubated at one range of temperatures produce male crocodiles and at another temperature produce female crocodiles (Pezaro et al., 2017). In this way a contextual factor (temperature) determines how genes are expressed (sex).

According to evolutionary developmental theory, genetic factors and biological predispositions interact with the physical and social environment to influence development, and natural selection determines which genes and traits are passed on to the next generation (Bjorklund, 2018a; Witherington & Lickliter, 2016). People are viewed as active in their development, influencing their contexts, responding to the demands for adaptation posed by their contexts, and constantly interacting with and adapting to the world around them. The relevance of both biological and contextual factors to human development is indisputable, and most developmental scientists appreciate the contributions of evolutionary developmental theory (DelGiudice, 2018; Frankenhuus & Tiokhin, 2018; Legare et al., 2018). The ways in which biology and context interact and their influence on development changes over the course of the lifetime will be discussed throughout this book. Table 1.4 summarizes the theories of human development discussed.



Shortly after birth, goslings imprint to their mother, meaning that they bond to her and will follow her to ensure they will be fed and remain protected. Ethologists propose that animal and human caregiving behaviors have an evolutionary basis.

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**TABLE 1.4** ■ Comparing Theories of Human Development

	Is development influenced by nature or nurture?	Are individuals active or passive in their development?	Is development continuous or discontinuous?
Freud's psychosexual theory	<i>Greater emphasis on nature:</i> People are driven by inborn drives, but the extent to which the drives are satisfied influences developmental outcomes.	<i>Passive:</i> People are driven by inborn instincts and are not active participants in their development.	<i>Discontinuous:</i> Stages
Erikson's psychosocial theory	<i>Both nature and nurture:</i> Biological and social forces propel people through the stages and social and psychosocial influences determine the outcome of each stage.	<i>Active:</i> People are active in their development because they interact with their social world to resolve psychosocial tasks.	<i>Discontinuous:</i> Stages
Behaviorist theory	<i>Nurture:</i> Environmental influences shape behavior.	<i>Passive:</i> People are shaped and molded by their environment.	<i>Continuous:</i> Gradual process of learning new behaviors
Bandura's social learning theory	<i>Both nature and nurture:</i> Inborn characteristics and the physical and social environment influence behavior.	<i>Active:</i> Individuals are influenced by the environment but also play an active role in their development through reciprocal determinism.	<i>Continuous:</i> Gradual process of learning new behaviors

	Is development influenced by nature or nurture?	Are individuals active or passive in their development?	Is development continuous or discontinuous?
Piaget's cognitive-developmental theory	<i>Both nature and nurture:</i> An innate drive to learn coupled with brain development leads people to interact with the world. Opportunities provided by the physical and social environment influence development.	<i>Active:</i> Individuals actively interact with the world to create their own schemas.	<i>Discontinuous:</i> Stages
Information processing theory	<i>Both nature and nurture:</i> People are born with processing capacities that develop through maturation and environmental influences.	<i>Active:</i> People attend to, process, and store information.	<i>Continuous:</i> Gradual increase of skills and capacities
Vygotsky's sociocultural theory	<i>Both nature and nurture:</i> People learn through interactions with more skilled members of their culture; capacities are influenced by genes, brain development, and maturation.	<i>Active:</i> Individuals actively interact with members of their culture.	<i>Continuous:</i> Continuous interactions with others lead to developing new reasoning capacities and skills.
Bronfenbrenner's bioecological systems theory	<i>Both nature and nurture:</i> People's inborn and biological characteristics interact with an ever-changing context to influence behavior.	<i>Active:</i> People interact with their contexts, being influenced by their contexts but also determining what kinds of physical and social environments are created and how they change.	<i>Continuous:</i> People constantly change through their interactions with the contexts in which they are embedded.
Ethology and evolutionary developmental theory	<i>Both nature and nurture:</i> Genetic programs and biological predispositions interact with the physical and social environment to influence development, and Darwinian natural selection determines which genes and traits are passed on to the next generation.	<i>Active:</i> People interact with their physical and social environment.	<i>Both continuous and discontinuous:</i> People gradually grow and change throughout life, but there are sensitive periods in which specific experiences and developments must occur.

### Thinking in Context: Applied Developmental Science

Just after delivering a healthy baby girl, Maria and Fernando are overwhelmed by the intense love they feel for her. Like most new parents, they also worry about their new responsibility. They hope that their baby will develop a strong, secure, and close bond to them. They want their baby to feel loved and to love them.

1. What advice would a psychoanalytic theorist give Maria and Fernando? Contrast psychoanalytic with behaviorist perspectives. How might a behaviorist theorist approach this question?
2. How might an evolutionary developmental theorist explain bonding between parents and infants? What advice might an evolutionary developmental theorist give to Maria and Fernando?
3. Considering bioecological systems theory, what microsystem and mesosystem factors influence the parent-child bond? What role might exosystem and macrosystem factors take?

## RESEARCH IN HUMAN DEVELOPMENT

### LEARNING OBJECTIVE

- 1.4** Describe the methods and research designs used to study human development and the ethical principles that guide developmental science research.

Developmental scientists conduct research to gather information and answer questions about how people grow and change over their lives. They devise theories to organize what they learn from research and to suggest new **hypotheses** to test in research studies. By conducting multiple studies over time, developmental scientists refine their theories about lifespan human development and determine new questions to ask.

### Methods of Data Collection

Scientists use the term *data* to refer to the information they collect. How can we gather data about children, adolescents, and adults? Should we simply talk with our participants? Watch them as they progress through their days? Hook them up to machines that measure physiological activity such as heart rate or brain waves? Developmental scientists use a variety of different methods, or measures, to collect information.

### Observational Measures

Some researchers collect information by watching and monitoring people's behavior. Developmental scientists employ two types of observational measures: naturalistic observation and structured observation.

Scientists who use **naturalistic observation** observe and record behavior in natural, real-world settings. Coplan et al. (2015) studied peer interaction patterns in children by observing 9- to 12-year-old children in the schoolyard during recess and lunch. They recorded the children's activity and interaction with peers and found that children who were consistently unengaged with peers tended to show high levels of problems, such as anxiety, depression, and loneliness, as reported by both the children and their mothers.

A challenge of using naturalistic observation is that sometimes the presence of an observer causes those being observed to behave unnaturally. This is known as *participant reactivity*. One way of reducing the effect of participant reactivity is to conduct multiple observations so that the children get used to the observer and return to their normal behavior.

Naturalistic observation permits researchers to observe patterns of behavior in everyday settings, such as whether one particular event or behavior typically precedes another. Naturalistic observation is a useful way of studying events and behaviors that are common. Some behaviors and events are uncommon or are difficult to observe, such as physical aggression among adults,



Researchers experimentally manipulate which children play with violent video games to determine their effect on behavior.

istock/ sakkmeisterke



This researcher is using a video camera to observe and record the facial expressions a newborn baby makes while they sleep.

Thierry Berrod, Mona Lisa Production/Science Source

requiring a researcher to observe for very long periods of time to obtain data on the behavior of interest. For this reason, many researchers make structured observations.

**Structured observation** entails observing and recording behaviors displayed in a controlled environment, a situation constructed by the experimenter. Children might be observed in a laboratory setting as they play with other children or complete a puzzle-solving task. The challenges of identifying and categorizing which behaviors to record are similar to those involved in naturalistic observation. The laboratory environment permits researchers to exert more control over the situation than is possible in natural settings. One challenge to conducting structured observations is that people do not always behave in laboratory settings as they do in real life.

### Self-Report Measures

Interviews and questionnaires are known as self-report measures because the person under study answers questions about his or her experiences, attitudes, opinions, beliefs, and behavior. Interviews can take place in person, over the phone, or over the Internet.

One type of interview is the **open-ended interview**, in which a trained interviewer uses a conversational style that encourages the participant, or the person under study, to expand his or her responses. Interviewers may vary the order of questions, probe, and ask additional questions based on responses. The scientist begins with a question and then follows up with prompts to obtain a better view of the person's reasoning (Ginsburg, 1997).

Open-ended interviews permit participants to explain their thoughts thoroughly and in their own words. They also enable researchers to gather a large amount of information quickly. Open-ended interviews are very flexible but this poses a challenge: When questions are phrased differently for each person, responses may not capture real differences in how people think about a given topic and instead may reflect differences in how the questions were posed and followed up by the interviewer.

In contrast, a **structured interview** poses the same set of questions to each participant in the same way. On the one hand, structured interviews are less flexible than open-ended interviews. On the other hand, because all participants receive the same set of questions, differences in responses are more likely to reflect true differences among participants and not merely differences in the manner of interviewing.

To collect data from large samples of people, scientists may compile and use **questionnaires**, also called surveys, made up of sets of questions, typically multiple choice. Questionnaires can be administered in person, online, or by telephone, email, or postal mail. Questionnaires are popular data collection methods because they are easy to use and enable scientists to collect information from many people quickly and inexpensively. Scientists who conduct research on sensitive topics, such as sexual interest and experience, often use questionnaires because they can easily be administered anonymously, protecting participants' privacy. For example, the Monitoring the Future Study is an annual survey of

50,000 8th-, 10th-, and 12th-grade students that collects information about their behaviors, attitudes, and values concerning drug and alcohol use (Miech et al., 2017). The survey permits scientists to gather an enormous amount of data, yet its anonymity protects the adolescents from the consequences of sharing personal information that they might not otherwise reveal.

Despite their ease of use, self-report measures are not without challenges. Questionnaires rely on a person's ability to read and understand questions and provide responses. Sometimes people give socially desirable answers: They respond in ways they would like themselves to be perceived or believe researchers desire. Self-report data, then, may not always reflect people's true attitudes and behavior. Some argue that we are not always fully aware of our feelings and therefore cannot always provide useful insight into our own thoughts and behavior with the use of self-report measures (Newell & Shanks, 2014).



The interviewer may ask a child about their own experiences, opinions, and behavior. Interviews and questionnaires are known as self-report measures.

damircudic/ Getty Images

## Physiological Measures

Our body responses are an important source of information that can be used to understand psychological phenomena. Physiological measures offer important information increasingly used in developmental research because cognition, emotion, and behavior have physiological indicators. Do you feel your heart beat more rapidly or your palms grow sweaty when you give a class presentation? Increases in heart rate and perspiration are physiological measures of anxiety. Other researchers might measure cortisol, a hormone triggered by the experience of stress (Simons et al., 2017).

Eye movements and pupil dilation can also indicate attention and interest. Researchers who employ physiological measures might use pupil dilation as a measure of interest in infants and physiological arousal in adults (Wetzel et al., 2016; Feurer et al., 2017). Physiological measures of brain activity are a particularly promising source of data. Several tools are used to study the brain:

**Electroencephalography (EEG):** Measures electrical activity patterns produced by the brain via electrodes placed on the scalp. Researchers study fluctuations in activity that occur when participants are presented with stimuli or when they sleep.

**Computerized tomography scan (CT scan):** Compiles multiple x-ray images to create a 3-D image of a person's brain, including brain structures, bone, brain vasculature, and tissue.

**Positron emission tomography scan (PET scan):** Involves injecting a small dose of radioactive material into the participant's blood stream to monitor the flow of blood. Blood flows more readily to active areas of the brain, illustrating which parts of the brain are active as participants view stimuli and solve problems.

**Functional magnetic resonance imaging (fMRI):** Measures brain activity using a powerful magnet combined with radio waves to measure blood oxygen level. Active areas of the brain require more oxygen-rich blood, so an increased flow of oxygenated blood shows which parts of the brain are active as individuals complete cognitive tasks.

**Diffusion tensor imaging (DTI):** Uses an MRI machine to track how water molecules move in and around the fibers connecting different parts of the brain, measuring the thickness and density of the brain's neural connections.

An advantage of physiological measures is they do not rely on verbal reports and generally cannot be faked. A challenge to physiological measures is that although physiological responses can be recorded, they may be difficult to interpret. For instance, excitement and anger may both cause an increase in heart rate. Data collection methods are summarized in Table 1.5.

## Research Designs

In addition to determining the research question and deciding what information to collect, scientists must choose a research design—a technique for conducting the research study.

### Case Study

A **case study** is an in-depth examination of a single person (or small group of individuals). It is conducted by gathering information from many sources, such as through observations, interviews, and conversations with family, friends, and others who know the individual. A case study may include samples or interpretations of a person's writing, such as poetry or journal entries, artwork, and other creations. A case study provides a rich description of a person's life and influences on his or her development. It is often employed to study individuals who have unique and unusual experiences, abilities, or disorders. Conclusions drawn from a case study may shed light on an individual's development but may not be generalized or applied to others. Case studies can be a source of hypotheses to examine in large-scale research.

**TABLE 1.5** ■ Data Collection Methods

	Advantage	Disadvantage
<b>Observational Measures</b>		
Naturalistic observation	Gathers data on everyday behavior in a natural environment as behaviors occur	The observer's presence may influence the children's behavior. No control over the observational environment.
Structured observation	Observation in a controlled setting	May not reflect real-life reactions and behavior
<b>Self-Report Measures</b>		
Open-ended interview	Gathers a large amount of information quickly and inexpensively	Nonstandardized questions. Characteristics of the interviewer may influence participant responses.
Structured interview	Gathers a large amount of information quickly and inexpensively	Characteristics of the interviewer may influence children's responses.
Questionnaire	Gathers data from a large sample more quickly and inexpensively than by interview methods	Some participants may respond in socially desirable or inaccurate ways.
Physiological Measures	Assesses biological indicators and does not rely on participant report. Difficult to fake responses.	May be expensive, difficult for researchers to access, and difficult to interpret.

### Correlational Research

Are children with high self-esteem more likely to excel at school? Are older adults with more friends happier than those with few? Are college students who work part-time less likely to graduate? All of these questions can be studied with **correlational research**, which permits researchers to examine relations among measured characteristics, behaviors, and events. In one study, scientists examined the relationship between physical fitness and academic performance in middle school students and found that children with higher aerobic capacity scored higher on achievement tests than did children with poorer aerobic capacity (Bass et al., 2013). Note that this correlation does not tell us *why* aerobic capacity was associated with academic achievement. Correlational research cannot answer this question because it simply describes relationships that exist among variables; it does not enable us to reach conclusions about the causes of those relationships. It is likely that other variables influence both a child's aerobic ability and achievement (e.g., health), but correlation does not enable us to determine the causes for behavior—for that we need an experiment.

### Experimental Research

Scientists who seek to test hypotheses about *causal* relationships, such as whether media exposure influences behavior or whether hearing particular types of music influences mood, employ **experimental research**. An experiment is a procedure that uses control to determine causal relationships among variables. Specifically, one or more **independent variables** thought to influence a behavior of interest are changed, or manipulated, while other variables are held constant. Researchers can then examine how the changing variable influences the **dependent variable**, the behavior under study. If the behavior changes as the variable changes, this suggests that the variable caused the change in the behavior. That is, a cause and effect relationship has been demonstrated.

Gentile et al. (2017) examined the effect of playing violent videogames on children's physiological stress and aggressive thoughts. Children were assigned to play a violent videogame (*Superman*) or a nonviolent videogame (*Finding Nemo*) for 25 minutes in the researchers' lab (independent variable). The researchers measured physiological stress as indicated by heart rate and cortisol levels before and after the children played the videogame (dependent variable). The researchers found that children

who played violent videogames showed higher levels of physiological stress than did the children who played nonviolent videogames. They concluded that the type of videogame changed children's stress reactions.

Developmental scientists conduct studies that use both correlational and experimental research. Studying development requires that scientists pay close attention to age and how people change over time, which requires the use of specialized research designs, as described in the following sections.

## Developmental Research Designs

Does personality change over the lifespan? Do children outgrow shyness? Are infants' bonds with their parents associated with their adult relationships? These questions require that developmental scientists examine relationships among variables over time.

### Cross-Sectional Research Design

A **cross-sectional research study** compares groups of people of different ages at a single point in time. Suppose a researcher wanted to know how alcohol use changes from early to late adolescence, from age 12 to 18. To study this question the researcher might visit a school system and administer a survey about alcohol use to students aged 12, 14, 16, and 18. By analyzing the survey, the scientist can describe *age differences* in alcohol use and identify how 12-year-olds differ from 18-year-olds today. However, the results do not tell us whether the observed age differences in alcohol use reflect age-related or developmental change. In other words, we do not know whether the 12-year-olds in this sample will show the same patterns of alcohol use as the current 18-year-olds when they are 18, six years from now.

Cross-sectional research permits age comparisons, but participants differ not only in age but in cohort. In developmental science, a cohort is a group of people of the same age who are exposed to similar historical events and cultural and societal influences. Cohorts refer to generations, but we can also speak of smaller cohorts based on factors such as the year of entry to school. In this example, the 12-year-olds and the 18-year-olds are different ages, but they are also in different cohorts, so the two groups may differ in reported alcohol use because of development (age-related changes) or cohort (group-related changes). Perhaps the 12-year-olds received a new early prevention program at school that was not available to the 18-year-olds when they were 12. The difference in alcohol use between 12-year-olds and 18-year-olds might then be related to the prevention program, a cohort factor, and not to age. Cross-sectional research is an important source of information about age differences, but it cannot provide information about age-related changes because participants are assessed only once.

### Longitudinal Research Design

A **longitudinal research study** follows the same group of participants over many points in time. Returning to the previous example, to examine how alcohol use changes from 12 to 18 years of age, a developmental scientist using longitudinal research might administer a survey on alcohol use to 12-year-olds and then follow up two years later when they are 14, again when they are 16, and finally when they are 18. If a researcher began this study in 2022, the last round of data collection would not occur until 2028.

Longitudinal research provides information about age-related change because it follows individuals over time, enabling scientists to describe how the 12-year-olds' alcohol use changed as they progressed through adolescence. However, longitudinal research studies only one cohort, calling into question whether findings indicate developmental change or whether they are an artifact of the cohort under study. Was the group of 12-year-olds that the scientist chose to follow for six years somehow different from the cohorts or groups of students who came before or after? Because only one cohort is assessed, it is not possible to determine whether the observed changes are age-related changes or changes that are unique to the cohort examined. Research designs and developmental research designs are summarized in Table 1.6.

**TABLE 1.6** ■ Comparing Research Designs

Design	Strengths	Limitations
<b>Research Designs</b>		
Case Study	Provides a rich description of an individual	Conclusions may not be generalized to other individuals
Correlational	Permits the analysis of relationships among variables as they exist in the real world	Cannot determine cause and effect relations
Experimental	Permits a determination of cause-and-effect relations	Data collected in artificial environments may not represent behavior in real-world environments.
<b>Developmental Research Designs</b>		
Cross-sectional	More efficient and less costly than the longitudinal design. Permits the determination of age differences.	Does not permit inferences regarding age change. Confounds age and cohort.
Longitudinal	Permits the determination of age-related changes in a sample of participants assessed for a period of time.	Time consuming and expensive. Participant attrition may limit conclusions. Cohort-related changes may limit the generalizability of conclusions.

### Thinking in Context: Applied Developmental Science

Lua is interested in understanding academic achievement in elementary school students. Specifically, she believes that too much screen time harms students' achievement.

1. How might Lua gather information to address her hypothesis?
2. What are some of the challenges of measuring behaviors such as screen time?
3. What kind of research design should Lua use? What are the advantages and disadvantages of this design?
4. Suppose Lua wanted to know the long-term correlates of screen time. How might she study this question?

## RESEARCH ETHICS

### LEARNING OBJECTIVE

- 1.5** Discuss principles of research ethics and the ethical issues that may arise in developmental science research.

In addition to conducting research that is scientifically sound, developmental scientists must adhere to standards of ethical conduct in research.

### Ethical Principles for Research

Several basic ethical principles guide developmental scientists' work: (1) to do good and avoid harm; (2) **responsibility**, (3) integrity, (4) justice, and (5) **respect for autonomy** (American Psychological



Association, 2010; Society for Research in Child Development, 2021). Developmental scientists are obligated to do good and to avoid doing harm. Researchers must protect and help the individuals, families, and communities with which they work by maximizing the benefits and minimizing the potential harms of their work. Participating in research must never pose threats to individuals beyond those they might encounter in everyday life.

Second, developmental scientists must act responsibly by adhering to professional standards of conduct, clarifying their obligations and roles to others, and avoiding conflicts of interest. Developmental psychologists who conduct research with children and parents must clarify their role as scientists and not counselors or therapists. Researchers' responsibility extends beyond their participants to society at large to ensure that their research findings are accurately portrayed in the media. The principle of responsibility means that researchers must attempt to foresee ways in which their results may be misinterpreted and correct any misinterpretations that occur (Lilienfeld, 2002; Society for Research in Child Development, 2007)

The principle of integrity requires that scientists be accurate, honest, and truthful in their work by being mindful of the promises they make to participants and making every effort to keep their promises to the people and communities with which they work. In addition, the risks and benefits of research participation must be spread equitably across individuals and groups. This is the principle of justice. Every participant should have access to the contributions and benefits of research. When a treatment or intervention under study is found to be successful, all participants must be given the opportunity to benefit from it.

Perhaps the most important principle of research ethics is respect for autonomy. Scientists have a special obligation to respect participants' autonomy—their ability to make and implement decisions. Ethical codes of conduct require that researchers protect participants' autonomy by obtaining **informed consent**—participants' informed, rational, and voluntary agreement to participate. Soliciting informed consent requires providing the individuals under study with information about the research study, answering questions, and ensuring that they understand that they are free to decide not to participate in the research study and that they will not be penalized if they refuse.

### Ethical Issues in Studying Lifespan Human Development

Each period in the lifespan poses unique ethical concerns for researchers. Common and pressing ethical challenges include soliciting consent, maintaining participant confidentiality, and protecting participants from harm.

#### Informed Consent

Respecting people's autonomy also means protecting those who are not capable of making judgments and asserting themselves. Parents provide permission for their minor children to participate because researchers (and lawmakers) assume that minors are not able to meet the rational criteria of informed consent. Although children cannot provide informed consent, researchers respect their growing capacities for decision making in ways that are appropriate to their age by seeking **child assent**—children's agreement to participate (Tait & Geisser, 2017). For toddlers or young children, obtaining assent may involve simply asking if they want to play with the researcher (Brown et al., 2017). With increasing cognitive and social development, children are better able to understand the nature of science and engage meaningfully in decisions about research participation. Discussions about research participation should be tailored to children's development, including offering more detailed information and seeking more comprehensive assent as children grow older (Roth-Cline & Nelson, 2013).

Studying adolescents often raises unique ethical questions because they are minors, generally requiring parental consent. Adolescent research participants are often very concerned about how their information and samples will be used, and in particular, whether information would be shared with their parents (Crane & Broome, 2017). Sometimes seeking consent from parents may interfere with researchers' goals or may pose risks to minor participants. In one study, LGBT adolescents believed that participating in research on sexuality and health is important for advancing science, yet indicated that they would not participate if guardian permission were required, citing negative parental attitudes or not being "out" about their LBGT identity (Macapagal et al., 2017).

In response to these ethical challenges, researchers frequently obtain **passive consent** for conducting research on sensitive topics with adolescents. Passive consent procedures typically involve notifying parents about the research and requiring them to reply if they do *not* want their child to participate. Studies that examine sensitive topics, such as risky behaviors, may benefit from the use of passive consent procedures because they are associated with more diverse samples of adolescents that better represent the population (Liu et al., 2017).

Adults also sometimes require accommodations for providing informed consent. Traumatic brain injury, dementia, mental illness, some physical illnesses, and advanced age can impair adults' capacities to provide informed consent (Prusaczyk et al., 2017). In such cases, researchers seek assent by providing the participant with meaningful information in a format that they can understand (as well as obtaining consent from a surrogate decision maker). Cognitive capacities can often fluctuate and, in the case of traumatic brain injury patients, often improves (Triebel et al., 2014). Researchers must be prepared to tailor their explanations to the participant's fluctuating competence.

### Confidentiality

Ethical issues may arise when researchers' desire to learn about development and solve problems conflicts with their need to protect research participants. Researchers generally promise participants **confidentiality**—that their responses will remain confidential and will not be disclosed to others. Suppose a researcher studying adolescents learns that a participant is in jeopardy, whether because she is engaging in health-compromising behaviors (e.g., cigarette smoking, unsafe driving, or unhealthy behavior), contemplating suicide, or engaging in illegal or harmful activities (e.g., drug addiction, stealing, or violence). Is the researcher responsible for helping the adolescent? Does the researcher have a duty to disclose the risk to an outside party who can help the adolescent, such as parents? Does the researcher's promise of confidentiality outweigh the duty to disclose? Adolescents and parents tend to have different opinions about research disclosures; parents often want to receive their children's research information, but adolescents tend to report wanting to withhold private and sensitive findings (Brawner et al., 2013).

Researchers who study risky and health-compromising behaviors *expect* to encounter participants who are engaged in potentially dangerous activities. Helping the adolescent might involve removing him or her from the study and potentially compromising the study. Adolescents generally expect that researchers will maintain confidentiality (Fisher et al., 1996); violating their confidentiality may be harmful.

Issues with confidentiality are common when studying adolescents, but they arise throughout the lifespan. Suppose a researcher is studying older adults in a nursing home and discovers illicit substance dependence in an adult who is also taking many medications? Or a sexual relationship of an adult who experiences bouts of dementia? Or suicidal thoughts in a middle-aged parent?

Ethical guidelines published by research and medical associations address researchers' obligations to help and not harm and to protect participants' confidentiality, but they generally fail to offer specific recommendations about how researchers can manage the conflicting duties to maintain confidentiality and disclose participant problems (Hiriscau et al., 2014; Sharkey et al., 2017). Instead, researchers must decide for themselves how to balance their sometimes conflicting obligations to their participants. Table 1.7 summarizes the rights of research participants.

### Thinking in Context: Applied Developmental Science

1. Suppose, as part of your research, you wanted to interview children at school. What ethical principles are most relevant to examining schoolchildren? What challenges do you anticipate in conducting this work?
2. You are tasked with collecting observations and interviews of older adults to evaluate a health program at a nursing home. What ethical issues can you anticipate? What principles are most pertinent?

**TABLE 1.7** ■ Rights of Research Participants

Right	Description
Protection from harm	Research participants have the right to be protected from physical and psychological harm. Investigators must use the least stressful research procedure in testing hypotheses and, when in doubt, consult with others.
Informed consent	Participants have the right to be informed about the purpose of the research, expected duration, procedures, risks and benefits of participation, and any other aspects of the research that may influence their willingness to participate. When children are participants, a parent or guardian must provide informed consent on behalf of the child, and the investigator should seek assent from the child.
Confidentiality	Participants have the right to privacy and to conceal their identity on all information and reports obtained in the course of research.
Information about the results	Participants have the right to be informed of the results of research in language that matches their level of understanding.
Treatment	If an experimental treatment under investigation is believed to be beneficial, participants in control groups have the right to obtain the beneficial treatment.

Sources: American Psychological Association, 2010; Society for Research in Child Development, 2007.

### Thinking in Context: Intersectionality

Some ethical concerns are more pressing for some participants and in some studies than others. Consider a study examining sexuality. People of different ages and characteristics might vary in their concerns about confidentiality in sexuality research.

1. To what extent do you think adolescents, adults, and older adults might vary in their concerns about sharing their sexual interests, beliefs, and behaviors??
2. What other variables might be associated with different perspectives on the value of confidentiality? Might you expect cultural differences in concerns about confidentiality? Might factors like sexual orientation, religion, gender, race, or ethnicity relate to concerns about confidentiality in sexuality research? Why or why not?

## APPLIED DEVELOPMENTAL SCIENCE AND INTERSECTIONALITY

### LEARNING OBJECTIVE

- 1.6** Describe the field of applied developmental science and the role of intersectionality in development.

In its early years, the study of human development emphasized laboratory research devoted to uncovering universal aspects of development by stripping away contextual influences. This *basic research* was designed to examine how development unfolds, with the assumption that development is a universal process with all people changing in similar ways and in similar timeframes. In the early 1980s, influenced by contextual theories (such as Bronfenbrenner's bioecological approach) and the growing assumption that people are active in their development (a cornerstone of lifespan developmental theory), developmental scientists began to examine developmental processes outside of the laboratory (Lerner et al., 2015). As developmental scientists engaged in *applied research*, it quickly became apparent that there are a great many individual differences in development that vary with myriad contextual influences. We also learned that developmental research findings can be applied to improve people's lives.

## Applied Developmental Science

**Applied developmental science** is a field of study that examines the lifelong developmental interactions among individuals and their contexts and applies these findings to prevent and intervene in problems and promote positive development (Fisher et al., 2013). Applied developmental scientists study pressing social issues, such as promoting the development of preterm infants, determining children's capacity to provide courtroom testimony, promoting safe sex in adolescents and emerging adults, and aiding older adults' and their adult children's adjustment to disability (Fisher, et al, 2013; Lerner, 2012). By its very nature, applied developmental science is multidisciplinary because real-world problems are complex and require the expertise of scientists from many fields, such as human development, psychology, medicine, biology, anthropology, and more.

Applied developmental scientists are especially interested in promoting healthy development over the lifespan. That is, they seek to enhance the life chances of diverse groups of individuals, families, and communities. Many children, adolescents, and adults are affected by social problems that can impede healthy development, such as hunger, poor nutrition, pervasive poverty, and inadequate access to education, health care, and community services (Aizer, 2017; Gauvain, 2018; Golinkoff et al., 2017; Huston, 2018). It is through applied research that scientists have come to appreciate the full range of contextual influences on development and how lifelong opportunities and outcomes vary with factors such as sex, ethnicity, socioeconomic status, and age.

Applied developmental scientists also work to understand and address the systemic disparities in opportunities that people experience over the lifespan (Fisher et al., 2012). They seek to promote equity and social justice, the basic human right of individuals to have access to opportunities, experiences, and resources that maximize their potential for growth, health, and happiness across the life course (Brown et al., 2019; Smith & Smith Lee, 2019). Individuals' access to support and opportunity varies dramatically with race, sex, and other factors. Equity and social justice involve recognizing and addressing these disparities and the complex factors that contribute to them.

## Intersectionality and Development

We are all members of multiple intertwined social categories, such as gender, race, age, and sexual orientation. Our understanding and experience of each category is influenced by our membership in other categories. Adolescents' understanding and experience of gender may be filtered through the lens of their membership in another social category, such as ethnicity. Latina girls' views of themselves and their worlds may be quite different from those of Latino boys as well as girls of other ethnicities, such as Black and white girls. In this example, the intersection of ethnicity and gender influences girls' self-understanding and experience. Power and opportunity are enmeshed with social categories such as ethnicity and gender. Latina girls' views of themselves reflect not simply their sex and ethnicity, but the relative power ascribed to girls and persons of color in U.S. society.

Our unique experiences and perspectives are influenced by **intersectionality**, which describes the dynamic interrelations of social categories—gender, race and ethnicity, sexual orientation, socioeconomic status, immigration status, age, and disabilities—and the interwoven systems of power and privilege that accompany social category membership (Crenshaw, 1989). An intersectional perspective draws attention to inequities in power, opportunity, privilege, and disadvantage that accompany social category membership and are experienced as racism, sexism, classism, heterosexism, and more, to shape individuals' lived experiences (Roy, 2018; Santos & Toomey, 2018; Syed & Ajayi, 2018).

Central to intersectionality are the assumptions that (1) all individuals have multiple identities that converge; (2) within each identity is a dimension of power or oppression; and (3) identities are influenced by their sociocultural context (Abrams et al., 2020; Else-Quest & Hyde, 2016). Identities overlap and systems of oppression, such as racism and sexism, may interlock. Individuals therefore experience multiple overlapping identities and may struggle against intertwined systems of oppression and bias (Rosenthal, 2016).

The effects of social category membership are not experienced universally, but vary with context (Ghavami et al., 2016; Godfrey & Burson, 2018). Intersectionality is inherently tied to context.

Social categories such as gender, race, and sexual orientation may be more salient and meaningful in some contexts and at some times than others, creating distinct experiences for subgroup members with implications for development (Crenshaw, 1989; Syed & Ajayi, 2018). For instance, intersecting expectations about race and gender may uniquely shape how Black boys are perceived and treated in classroom settings; their experience is unique from that of boys of other races and ethnicities and that of Black girls—with implications for their academic performance, development, and long-term outcomes (Roy, 2018). Likewise, Black boys' classroom experiences might vary with context (rural, suburban, or urban) and geographic location (North, South, Midwest, or coastal United States).

Until recently, people of color have either been largely excluded from research studies or grouped with participants of all ethnicities and races, masking differences and contributing to a sense of invisibility (Grzanka, 2020; Roberts et al., 2020; Syed et al., 2018). One analysis of articles published between 2006 and 2010 in leading developmental science journals (*Developmental Psychology*, *Child Development*, and *Developmental Science*) found that only 14% included samples that were predominantly people of color and a surprisingly high 28% did not mention the racial/ethnic composition at all (Nielsen et al., 2017).

The study of intersectionality sheds light on how discrimination, marginalization, oppression, and privilege combine to influence individuals' experiences in unique ways across the lifespan (Crenshaw, 1989). Intersectionality is an emerging approach in **developmental science**, with a small but rapidly growing body of research that recognizes the many ways that gender, ethnicity and race, sexual orientation, socioeconomic status, and disability interact to influence development (Godfrey & Burson, 2018; Grzanka, 2020). Throughout this book we will examine development through an intersectional lens whenever possible.



These students attend the same school, but their experiences may vary greatly with intersectional factors such as race, ethnicity, and gender.

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### Thinking in Context: Intersectionality

1. Consider the social categories of which you are a member (perhaps gender, race, or ethnicity, socioeconomic status, or religion). Which are most important to you? How might these social categories interact to influence your experiences?
2. Consider our discussion of research methods earlier in this chapter. What are some of the challenges of studying the real-world problems addressed by applied developmental science? Do any special considerations arise when studying development through an intersectional lens?

## CHAPTER SUMMARY

### 1.1 Outline five principles of the lifespan developmental perspective.

Development is a lifelong process. It is multidimensional, multidirectional, plastic, influenced by the multiple contexts in which we are embedded, and multidisciplinary.

### 1.2 Explain three basic issues in developmental science.

Developmental scientists take different perspectives on three views. First, in what ways is developmental change continuous, characterized by slow and gradual change, or discontinuous, characterized by sudden and abrupt change? Second, to what extent do people play an active role

in their own development, interacting with and influencing the world around them? Finally, is development caused by nature or nurture? Most developmental scientists agree that some aspects of development appear continuous and others discontinuous, that individuals are active in influencing their development, and that development reflects the interactions of nature and nurture.

### **1.3 Summarize five theoretical perspectives on human development.**

Psychoanalytic theories emphasize inner drives. Freud's psychosexual theory emphasizes psychosexual stages. Erikson's psychosocial theory suggests that individuals move through eight stages of psychosocial development across the lifespan, with each stage presenting a unique psychosocial task, or crisis. Behaviorist and social learning theories emphasize environmental influences on behavior, specifically operant conditioning, as well as observational learning. Piaget's cognitive-developmental theory describes cognitive development as an active process that proceeds through four stages. Information processing theorists study the steps involved in cognition: perceiving and attending, representing, encoding, retrieving, and problem solving. Contextual and systems theories look to the importance of context in shaping development. Vygotsky's sociocultural theory emphasizes interactions with members of our culture in influencing development. Bronfenbrenner's bioecological model explains development as a function of the ongoing reciprocal interaction among biological and psychological changes in the person and his or her changing context. Evolutionary developmental psychology integrates Darwinian principles of evolution and scientific knowledge about the interactive influence of genetic and environmental mechanisms.

### **1.4 Describe the methods and research designs used to study human development and ethical principles that guide developmental science research.**

A case study is an in-depth examination of an individual. Interviews and questionnaires are called self-report measures because they ask the persons under study questions about their own experiences, attitudes, opinions, beliefs, and behavior. Observational measures are methods that scientists use to collect and organize information based on watching and monitoring people's behavior. Physiological measures gather the body's physiological responses as data. Scientists use correlational research to describe relations among measured characteristics, behaviors, and events. To test hypotheses about causal relationships among variables, scientists employ experimental research. Developmental designs include cross-sectional research and longitudinal research. Researchers must maximize the benefits to research participants, minimize the harms, be accurate and honest in their work, and respect participants' autonomy, including seeking informed consent and child assent.

### **1.5 Discuss principles of research ethics and the ethical issues that may arise in developmental science research.**

Researchers must maximize the benefits to research participants and minimize the harms, safeguarding participants' welfare. They must be accurate and honest in their work and respect participants' autonomy, including seeking informed consent and child assent. In addition, the benefits and risks of participation in research must be spread equitably across individuals and groups. Specific ethical concerns about informed consent, the use of passive consent, and how to protect participant confidentiality arise in conducting research in lifespan development.

### **1.6 Describe the field of applied developmental science and the role of intersectionality in development.**

Applied developmental science examines the lifelong interactions among individuals and their contexts and applies these findings to prevent and intervene in problems and promote positive development in people of all ages. Our unique experiences and perspectives are influenced by intersectionality, the dynamic interrelations of social categories—gender, race and ethnicity, sexual orientation, socioeconomic status, immigration status, and disabilities—and the interwoven systems of power and privilege that accompany social category membership. Individuals experience multiple overlapping identities and struggle against intertwined systems

of oppression and bias. Intersectionality is inherently tied to context because the personal importance of social categories and the meaning ascribed to them vary with context. The study of intersectionality sheds light on how discrimination, marginalization, oppression, and privilege combine to influence individuals' experiences in unique ways across the lifespan.

## KEY TERMS

- applied developmental science (p. 28)  
 behaviorism (p. 11)  
 bioecological systems theory (p. 14)  
 case study (p. 21)  
 child assent (p. 25)  
 cognitive-developmental theory (p. 13)  
 cognitive development (p. 3)  
 cohort (p. 5)  
 context (p. 4)  
 continuous change (p. 6)  
 correlational research (p. 22)  
 cross-sectional research study (p. 23)  
 culture (p. 5)  
 dependent variable (p. 22)  
 development (p. 1)  
 developmental science (p. 29)  
 discontinuous change (p. 6)  
 domains of development (p. 5)  
 emerging adulthood (p. 2)  
 ethology (p. 16)  
 evolutionary developmental theory (p. 16)  
 experimental research (p. 22)  
 hypotheses (p. 19)  
 independent variable (p. 22)  
 information processing theory (p. 13)  
 Informed consent (p. 25)  
 lifespan human development (p. 1)  
 longitudinal research study (p. 23)  
 naturalistic observation (p. 19)  
 observational learning (p. 12)  
 open-ended interview (p. 20)  
 passive consent (p. 26)  
 physical development (p. 3)  
 plasticity (p. 3)  
 psychoanalytic theories (p. 9)  
 punishment (p. 11)  
 questionnaire (p. 20)  
 reciprocal determinism (p. 12)  
 reinforcement (p. 11)  
 resilience (p. 3)  
 respect for autonomy (p. 24)  
 responsibility (p. 24)  
 social learning theory (p. 12)  
 sociocultural theory (p. 14)  
 socioemotional development (p. 3)  
 structured interview (p. 20)  
 structured observation (p. 20)  
 theory (p. 9)