TABLE 1-2 FREUD'S AND ERIKSON'S THEORIES

Approximate Age	Freud's Stages of Psychosexual Development	Major Characteristics of Freud's Stages	Erikson's Stages of Psychosocial Development	Positive and Negative Outcomes of Erikson's Stages
Birth to 12–18 months	Oral	Interest in oral gratification from sucking, eating, mouthing, biting	Trust vs. mistrust	*Positive:* Feelings of trust from environmental support *Negative:* Fear and concern regarding others
12–18 months to 3 years	Anal	Gratification from expelling and withholding feces; coming to terms with society's controls relating to toilet training	Autonomy vs. shame and doubt	*Positive:* Self-sufficiency if exploration is encouraged *Negative:* Doubts about self, lack of independence
3 to 5–6 years	Phallic	Interest in the genitals; coming to terms with Oedipal conflict, leading to identification with same-sex parent	Initiative vs. guilt	*Positive:* Discovery of ways to initiate actions *Negative:* Guilt from actions and thoughts
5–6 years to adolescence	Latency	Sexual concerns largely unimportant	Industry vs. inferiority	*Positive:* Development of sense of competence *Negative:* Feelings of inferiority, no sense of mastery
Adolescence to adulthood (Freud) Adolescence (Erikson)	Genital	Reemergence of sexual interests and establishment of mature sexual relationships	Identity vs. role diffusion	*Positive:* Awareness of uniqueness of self, knowledge of role to be followed *Negative:* Inability to identify appropriate roles in life
Early adulthood (Erikson)			Intimacy vs. isolation	*Positive:* Development of loving, sexual relationships and close friendships *Negative:* Fear of relationships with others
Middle adulthood (Erikson)			Generativity vs. stagnation	*Positive:* Sense of contribution to continuity of life *Negative:* Trivialization of one's activities
Late adulthood (Erikson)			Ego-integrity vs. despair	*Positive:* Sense of unity in life's accomplishments *Negative:* Regret over lost opportunities of life

psychosocial development the approach that encompasses changes in our interactions with and understandings of one another, as well as in our knowledge and understanding of ourselves as members of society

Erikson's Psychosocial Theory. Psychoanalyst Erik Erikson, who lived from 1902 to 1994, provided an alternative psychodynamic view, emphasizing our social interaction with other people. In Erikson's view, society and culture both challenge and shape us. **Psychosocial development** encompasses changes in our interactions with and understandings of one another as well as in our knowledge and understanding of us as members of society (Erikson, 1963).

Erikson's theory suggests that development proceeds throughout our lives in eight stages (see Table 1-2), which emerge in a fixed pattern and are similar for all people. Each stage presents a crisis or conflict that the individual must resolve. Although no crisis is ever fully

resolved, the individual must at least address the crisis of each stage sufficiently to deal with demands made during the next stage of development. Unlike Freud, who regarded development as relatively complete by adolescence, Erikson suggested that growth and change continue throughout the life span (de St. Aubin, McAdams, & Kim, 2004).

Assessing the Psychodynamic Perspective. Freud's insight that unconscious influences affect behavior was a monumental accomplishment, and the fact that it seems at all reasonable to us shows how extensively the idea of the unconscious has pervaded thinking in Western cultures. In fact, work by contemporary researchers studying memory and learning suggests that we unconsciously carry with us memories that have a significant impact on our behavior.

Some of the most basic principles of Freud's psychoanalytic theory have been questioned, however, because they have not been validated by research. In particular, the notion that childhood stages determine adult personalities has little research support. In addition, because much of Freud's theory was based on a limited population of upper-middle-class Austrians living during a strict, puritanical era, its application to broad, multicultural populations is questionable. Finally, because Freud's theory focuses primarily on male development, it has been criticized as sexist and interpreted as devaluing women (Messer & McWilliams, 2003; Schachter, 2005; Gillham, Law, & Hickey, 2010).

Erikson's view that development continues throughout the life span is highly important—and has received considerable support. However, the theory also has its drawbacks. Like Freud's theory, it focuses more on men than women. Further, its vagueness makes it difficult to test rigorously. And, as with psychodynamic theories in general, it is difficult to make definitive predictions about a given individual's behavior using the theory (Whitbourne et al., 1992; Zauszniewski & Martin, 1999; De St. Aubin & McAdams, 2004).
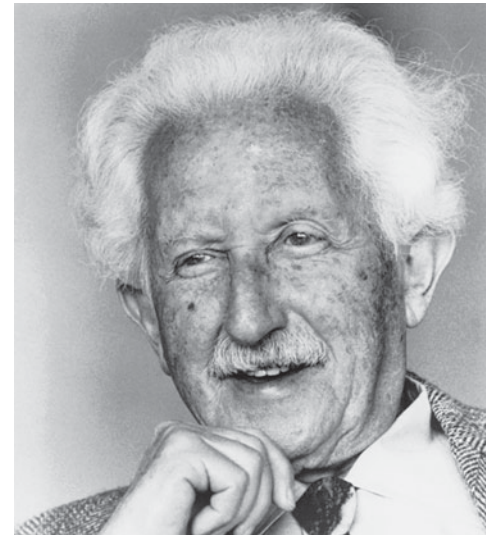
Erik Erikson

The Behavioral Perspective: Focusing on Observable Behavior

When Elissa Sheehan was 3, a large brown dog bit her, and she needed dozens of stitches and several operations. From the time she was bitten, she broke into a sweat whenever she saw a dog, and in fact never enjoyed being around any pet.

To a lifespan development specialist using the behavioral perspective, the explanation for Elissa's behavior is straightforward: She has a learned fear of dogs. Rather than looking inside the organism at unconscious processes, the **behavioral perspective** suggests that the keys to understanding development are observable behavior and environmental stimuli. If we know the stimuli, we can predict the behavior. In this respect, the behavioral perspective reflects the view that nurture is more important to development than nature.

Behavioral theories reject the notion that people universally pass through a series of stages. Instead, people are affected by the environmental stimuli to which they happen to be exposed. Developmental patterns, then, are personal, reflecting a particular set of environmental stimuli, and behavior is the result of continuing exposure to specific factors in the environment. Furthermore, developmental change is viewed in quantitative, rather than qualitative, terms. For instance, behavioral theories hold that advances in problem-solving capabilities as children age are largely a result of greater mental *capacities,* rather than changes in the *kind* of thinking that children can bring to bear on a problem.

Classical Conditioning: Stimulus Substitution.

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. . . . (Watson, 1925)

With these words, John B. Watson, one of the first American psychologists to advocate a behavioral approach, summed up the behavioral perspective. Watson, who lived from 1878 to 1958, believed strongly that we could gain a full understanding of development by carefully studying the stimuli that composed the environment. In fact, he argued that by effectively controlling—or *conditioning*—a person's environment, it was possible to produce virtually any behavior.

behavioral perspective the approach that suggests that the keys to understanding development are observable behavior and outside stimuli in the environment

John B. Watson

Classical conditioning occurs when an organism learns to respond in a particular way to a neutral stimulus. For instance, if the sound of a bell is paired with the arrival of meat, a dog will learn to react to the bell alone in the same way it reacts to the meat—by salivating and wagging its tail. The behavior is a result of conditioning, a form of learning in which the response associated with one stimulus (food) comes to be connected to another—in this case, the bell.

The same process of classical conditioning explains how we learn emotional responses. In the case of dog-bite victim Elissa Sheehan, for instance, Watson would say that one stimulus has been substituted for another: Elissa's unpleasant experience with a particular dog (the initial stimulus) has been transferred to other dogs and to pets in general.

Operant Conditioning. In addition to classical conditioning, the behavioral perspective accounts for other types of learning, especially what behavioralists call operant conditioning. **Operant conditioning** is a form of learning in which a voluntary response is strengthened or weakened by its association with positive or negative consequences. It differs from classical conditioning in that the response being conditioned is voluntary and purposeful rather than automatic (such as salivating). In operant conditioning, formulated and championed by psychologist B. F. Skinner (1904–1990), individuals learn to *operate* on their environments in order to bring about desired consequences (Skinner, 1975).

Whether or not children and adults will seek to repeat a behavior depends on whether it is followed by reinforcement. *Reinforcement* is the process by which a behavior is followed by a stimulus that increases the probability that the behavior will be repeated. Hence, a student is apt to work harder if he or she receives good grades; workers are likely to labor harder if their efforts are tied to pay increases; and people are more apt to buy lottery tickets if they are reinforced by winning occasionally. In addition, *punishment,* the introduction of an unpleasant or painful stimulus or the removal of a desirable stimulus, will decrease the probability that a preceding behavior will occur in the future.

Behavior that is reinforced, then, is more likely to be repeated, while behavior that receives no reinforcement or is punished is likely to be *extinguished* in the language of operant conditioning. Principles of operant conditioning are used in **behavior modification,** a formal technique for promoting the frequency of desirable behaviors and decreasing the incidence of unwanted ones. Behavior modification has been used in situations ranging from teaching people with severe retardation basic language to helping people with self-control problems stick to diets (Christophersen & Mortweet, 2003; Hoek & Gendall, 2006; Matson & LoVullo, 2008).

Social-Cognitive Learning Theory: Learning through Imitation. A 5-year-old boy seriously injures his 22-month-old cousin while imitating a violent wrestling move he has seen on television. Although the baby sustained spinal cord injuries, he improved and was discharged 5 weeks after his hospital admission (Reuters Health eLine, 2002).

Cause and effect? We can't know for sure, but it certainly seems possible, especially to social-cognitive learning theorists. According to developmental psychologist Albert Bandura and colleagues, a significant amount of learning is explained by **social-cognitive learning theory,** an approach that emphasizes learning by observing the behavior of another person, called a *model* (Bandura, 1994, 2002).

From a social worker's perspective: How do the concepts of social learning and modeling relate to the mass media, and how might exposure to mass media influence a child's family life?

According to social-cognitive learning theory, behavior is learned primarily through observation and not through trial and error, as it is with operant conditioning. We don't need to experience the consequences of a behavior ourselves to learn it. Social-cognitive learning theory holds that when we see the behavior of a model being rewarded, we are likely to imitate that behavior. For instance, in one classic experiment, children who were afraid of dogs were exposed to a model, nicknamed the "Fearless Peer," who was seen playing happily with a dog (Bandura, Grusec, & Menlove, 1967). After exposure, the children who previously had been afraid were more likely to approach a strange dog than children who had not seen the model.

classical conditioning a type of learning in which an organism responds in a particular way to a neutral stimulus that normally does not bring about that type of response

operant conditioning a form of learning in which a voluntary response is strengthened or weakened by its association with positive or negative consequences

behavior modification a formal technique for promoting the frequency of desirable behaviors and decreasing the incidence of unwanted ones

social-cognitive learning theory learning by observing the behavior of another person, called a model

Assessing the Behavioral Perspective.   Research using the behavioral perspective has made significant contributions, ranging from the education of children with severe mental retardation to the development of procedures for curbing aggression. At the same time, the perspective has experienced internal disagreements. For example, although part of the same behavioral perspective, classical and operant conditioning and social learning theory disagree in some basic ways. Classical and operant conditioning consider learning in terms of external stimuli and responses, in which the only important factors are the observable features of the environment. People and other organisms are like inanimate "black boxes"; nothing that occurs inside the box is understood—nor much cared about, for that matter.

To social learning theorists, such an analysis is an oversimplification. They argue that what makes people different from rats and pigeons is the mental activity, in the form of thoughts and expectations. We cannot derive a full understanding of people's development without moving beyond external stimuli and responses.

In many ways, social learning theory has won this argument in recent decades. In fact, another perspective that focuses explicitly on internal mental activity—the cognitive perspective—has become enormously influential.

The Cognitive Perspective: Examining the Roots of Understanding

When 3-year-old Jake is asked why it sometimes rains, he answers "so the flowers can grow." When his 11-year-old sister Lila is asked the same question, she responds "because of evaporation from the surface of the Earth." And when their cousin Ajima, who is studying meteorology in graduate school, considers the same question, her extended answer includes a discussion of cumulo-nimbus clouds, the Coriolis Effect, and synoptic charts.

To a developmental theorist using the cognitive perspective, the difference in the sophistication of the answers is evidence of a different degree of knowledge and understanding, or cognition. The **cognitive perspective** focuses on the processes that allow people to know, understand, and think about the world.

The cognitive perspective emphasizes how people internally represent and think about the world. By using this perspective, developmental researchers hope to understand how children and adults process information and how their ways of thinking and understanding affect their behavior. They also seek to learn how cognitive abilities change as people develop, the degree to which cognitive development represents quantitative and qualitative growth in intellectual abilities, and how different cognitive abilities are related to one another.

Piaget's Theory of Cognitive Development.   No one has had a greater impact on the study of cognitive development than Jean Piaget, a Swiss psychologist who lived from 1896 to 1980. Piaget proposed that all people pass through a fixed sequence of universal stages of cognitive development—and not only does the *quantity* of information increase in each stage, but the *quality* of knowledge and understanding changes as well. His focus was on the change in cognition that occurs as children move from one stage to the next (Piaget, 1952, 1962, 1983). Broadly speaking, Piaget suggested that human thinking is arranged into *schemes,* organized mental patterns that represent behaviors and actions. In infants, schemes represent concrete behavior—a scheme for sucking, for reaching, and for each separate behavior. In older children, the schemes become more sophisticated and abstract, such as the skills involved in riding a bike or playing an interactive video game. Schemes are like intellectual computer software programs that direct and determine how data from the world are looked at and handled (Parker, 2005).

Piaget suggested that the growth in children's understanding of the world could be explained by two basic principles: assimilation and accommodation. *Assimilation* is the process in which people understand a new experience in terms of their current stage of cognitive development and existing ways of thinking. In contrast, *accommodation* refers to changes in existing ways of thinking in response to encounters with new stimuli or events. Assimilation and accommodation work in tandem to bring about cognitive development.

Assessing Piaget's Theory.   Piaget has profoundly influenced our understanding of cognitive development and is one of the towering figures in lifespan development. He provided masterly descriptions of intellectual growth during childhood—descriptions that have stood
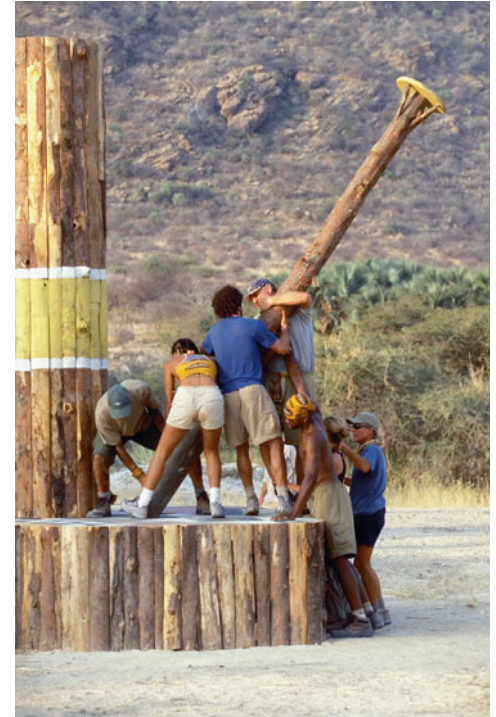
On the reality show *Survivor*, contestants often must learn new survival skills in order to be successful. What form of learning is prevalent?

cognitive perspective the approach that focuses on the processes that allow people to know, understand, and think about the world

information processing approaches the model that seeks to identify the ways individuals take in, use, and store information

cognitive neuroscience approaches the approach that examines cognitive development through the lens of brain processes

the test of literally thousands of investigations. Broadly, then, Piaget's view of cognitive development is accurate.

However, the specifics of the theory have been questioned. For instance, some cognitive skills clearly emerge earlier than Piaget suggested. Furthermore, the universality of Piaget's stages has been disputed. Growing evidence suggests that particular cognitive skills emerge on a different timetable in non-Western cultures. And in every culture, some people never seem to reach Piaget's highest level of cognitive sophistication: formal, logical thought (McDonald & Stuart-Hamilton, 2003; Genovese, 2006: Kesselring & Müller, 2010).

Ultimately, the greatest criticism is that cognitive development is not necessarily as discontinuous as Piaget's stage theory suggests. Many developmental researchers argue that growth is considerably more continuous. These critics have suggested an alternative perspective, known as the information processing approach, that focuses on the processes that underlie learning, memory, and thinking throughout the life span.

Information Processing Approaches. Information processing approaches have become an important alternative to Piagetian approaches. **Information processing approaches** to cognitive development seek to identify the ways individuals take in, use, and store information.

Information processing approaches grew out of developments in computers. They assume that even complex behavior such as learning, remembering, categorizing, and thinking can be broken down into a series of individual, specific steps.

Like computers, children are assumed by information processing approaches to have limited capacity for processing information. As they develop, though, they employ increasingly sophisticated strategies that allow them to process information more efficiently.

In stark contrast to Piaget's view, information processing approaches assume that development is marked more by quantitative advances than qualitative ones. Our capacity to handle information changes with age, as does our processing speed and efficiency. Furthermore, information processing approaches suggest that as we age, we are better able to control the nature of processing and the strategies we choose to process information.

An information processing approach that builds on Piaget's research is known as neo-Piagetian theory. In contrast to Piaget's original work, which viewed cognition as a single system of increasingly sophisticated general cognitive abilities, *neo-Piagetian theory* considers cognition as made up of different types of individual skills. Using the terminology of information processing approaches, neo-Piagetian theory suggests that cognitive development proceeds quickly in certain areas and more slowly in others. For example, reading ability and the skills needed to recall stories may progress sooner than the abstract computational abilities used in algebra or trigonometry. Furthermore, neo-Piagetian theorists believe that experience plays a greater role in advancing cognitive development than traditional Piagetian approaches claim (Case, Demetriou, & Platsidou, 2001; Yan & Fischer, 2002; Loewen, 2006).

Assessing Information Processing Approaches. As we'll see in future chapters, information processing approaches have become a central part of our understanding of development. At the same time, they do not offer a complete explanation of behavior. For example, they have paid little attention to behavior such as creativity, in which the most profound ideas often are developed in a seemingly nonlogical, nonlinear manner. In addition, they do not take into account the social context in which development takes place—and theories that do this have become increasingly popular.

Cognitive Neuroscience Approaches. One of the most recent additions to the array of approaches are **cognitive neuroscience approaches,** which look at cognitive development at the level of brain processes. Like other cognitive perspectives, cognitive neuroscience approaches consider internal, mental processes, but they focus specifically on the neurological activity that underlies thinking, problem solving, and other cognitive behavior.

Cognitive neuroscientists seek to identify actual locations and functions within the brain that are related to different types of cognitive activity. For example, using sophisticated brain scanning techniques, cognitive neuroscientists have demonstrated that thinking about the meaning of a word activates different areas of the brain than thinking about how the word sounds when spoken.
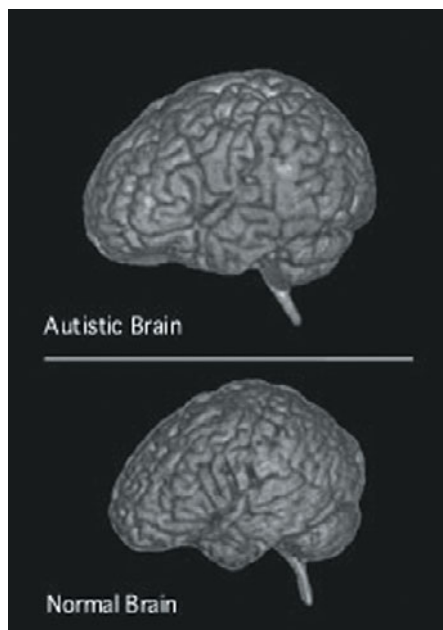

FIGURE 1-1 The Autistic Brain
Neuroscientists found in one study that brains of individuals with autism were larger than those without autism. This finding can help determine the disorder early so proper health care can be provided.
Source: Courchesne website at http://www.courchesneautismlab.org/mri.html.

Cognitive neuroscientists are also providing clues to the cause of *autism*, a major developmental disability that can produce profound language deficits and self-injurious behavior in young children. For example, neuroscientists have found that the brains of children with the disorder show explosive, dramatic growth in the first year of life, making their heads significantly larger than those of children without the disorder (see Figure 1-1). By identifying children with the disorder very early in their lives, health care providers can provide crucial early intervention (Akshoomoff, 2006; Nadel & Poss, 2007; Lewis & Elman, 2008; Bal et al., 2010).

Cognitive neuroscience approaches are also on the forefront of cutting edge research that has identified genes associated with disorders ranging from physical problems such as breast cancer to psychological disorders such as schizophrenia. Identifying the genes that make one vulnerable to such disorders is the first step in genetic engineering in which gene therapy can reduce or even prevent the disorder from occurring (DeLisi & Fleischhaker, 2007; Strobel et al., 2007; Ranganath, Minzenberg, & Ragland, 2008).

REVIEW, CHECK, AND APPLY

REVIEW

L05 Which theoretical perspectives have guided lifespan development?

- Lifespan development has been viewed from six major theoretical perspectives: the psychodynamic, behavioral, cognitive, humanistic, contextual, and evolutionary perspectives. Each emphasizes somewhat different aspects of development and steers developmentalists in particular directions.

L06 What are the main characteristics of the psychodynamic, behavioral, and cognitive perspectives?

- The psychodynamic perspective looks primarily at the influence of internal, unconscious forces on development.

- In contrast, the behavioral perspective focuses on external, observable behaviors as the key to development.

- The cognitive perspective focuses on mental activity, holding that individuals pass through stages in which their ways of thinking change both qualitatively and quantitatively.

CHECK YOURSELF

1. _____ are organized explanations and predictions concerning phenomena of interest and provide frameworks for understanding the relationships across variables.
   - a. Evaluations
   - b. Constitutions
   - d. Intuitions
   - d. Theories

2. The _____ perspective suggests that the key to understanding one's actions involves observation of those actions and the outside stimuli in the environment.

3. Which of the following is NOT a concern with Piaget's cognitive perspective?
   - a. Everyone reaches Piaget's highest level of thought, suggesting that it isn't much of an achievement.
   - b. Some cognitive skills appear much earlier than Piaget originally thought.
   - c. The timing of cognitive skills differs as a function of culture.
   - d. Cognitive development does not appear to be as discontinuous as Piaget suggested.

APPLYING LIFESPAN DEVELOPMENT

- Can you think of examples of human behavior that may have been inherited from our ancestors because they helped survival and adaptation? Explain why you think this.

✔●—**Study** and **Review** on **MyDevelopmentLab.com**

Answers: 1) d; 2) behavioral; 3) a

The Humanistic, Contextual, and Evolutionary Perspectives

L07 What are the main characteristics of the humanistic, contextual, and evolutionary perspectives?

L08 Why is there no "right" approach to development?

LEARNING OBJECTIVES

The Humanistic Perspective: Concentrating on Uniquely Human Qualities

The unique qualities of humans are the central focus of the humanistic perspective, the fourth of the major theories used by lifespan developmentalists. Rejecting the notion that behavior is largely determined by unconscious processes, the environment, or cognitive processing, the **humanistic perspective** contends that people have a natural capacity to make decisions about their lives and to control their behavior. According to this approach, each individual has the ability and motivation to reach more advanced levels of maturity, and people naturally seek to reach their full potential.

The humanistic perspective emphasizes *free will,* the ability of humans to make choices and come to decisions about their lives. Instead of relying on societal standards, then, people are assumed to be motivated to make their own decisions about what they do with their lives.

Carl Rogers, one of the major proponents of the humanistic perspective, suggests that people need positive regard, which results from an underlying wish to be loved and respected. Because positive regard comes from other people, we become dependent on them. Consequently, our view of ourselves and our self-worth is a reflection of how we think others view us (Rogers, 1971; Motschnig & Nykl, 2003; Cornforth, 2010).

Rogers, along with another key figure in the humanistic perspective, Abraham Maslow, suggests that self-actualization is a primary goal in life. *Self-actualization* is a state of self-fulfillment in which people achieve their highest potential in their own unique way (Maslow, 1970; Jones & Crandall, 1991; Sheldon, Joiner, & Pettit, 2003).

Assessing the Humanistic Perspective. Despite its emphasis on important and unique human qualities, the humanistic perspective has not had a major impact on the field of lifespan development. This is primarily due to its inability to identify any sort of broad developmental change that is the result of increasing age or experience. Still, some of the concepts drawn from the humanistic perspective, such as self-actualization, have helped describe important aspects of human behavior and are widely discussed in areas ranging from health care to business (Laas, 2006; Zalenski & Raspa, 2006; Elkins, 2009).

The Contextual Perspective: Taking a Broad Approach to Development

Although lifespan developmentalists often consider physical, cognitive, personality, and social factors separately, such a categorization has one serious drawback: In the real world, none of these broad influences occurs in isolation from any other. Instead, there is a constant, ongoing interaction between the different types of influence.

The **contextual perspective** considers the relationship between individuals and their physical, cognitive, personality, and social worlds. It suggests that a person's unique development cannot be properly viewed without seeing how that person is enmeshed within a rich social and cultural context. We'll consider two major theories that fall under this category, Bronfenbrenner's bioecological approach and Vygotsky's sociocultural theory.

The Bioecological Approach to Development. In acknowledging the problem with traditional approaches to lifespan development, psychologist Urie Bronfenbrenner (1989; 2000; 2002) has proposed an alternative perspective, the bioecological approach. The **bioecological approach** suggests that there are five levels of the environment that simultaneously influence individuals. Bronfenbrenner suggests that we cannot fully understand development without considering how a person is influenced by each of these levels.

- The *microsystem* is the everyday, immediate environment of children's daily lives. Homes, caregivers, friends, and teachers all are influences, but the child is not just a passive recipient. Instead, children actively help construct the microsystem, shaping their immediate world. The microsystem is the level to which most traditional work in child development has been directed.
- The *mesosystem* connects the various aspects of the microsystem. The mesosystem binds children to parents, students to teachers, employees to bosses, friends to friends. It

humanistic perspective the theory that contends that people have a natural capacity to make decisions about their lives and control their behavior

contextual perspective the theory that considers the relationship between individuals and their physical, cognitive, personality, and social worlds

bioecological approach the perspective suggesting that levels of the environment simultaneously influence individuals

acknowledges the direct and indirect influences that bind us to one another, such as those that affect a mother who has a bad day at the office and then is short-tempered with her son or daughter at home.

- The *exosystem* represents broader influences: societal institutions such as local government, the community, schools, places of worship, and the local media. Each of these institutions can have an immediate and major impact on personal development, and each affects how the microsystem and mesosystem operate. For example, the quality of a school will affect a child's cognitive development and potentially can have long-term consequences.

- The *macrosystem* represents the larger cultural influences on an individual, including society in general, types of governments, religious and political value systems, and other broad, encompassing factors. For example, the value a culture places on education affects the values of the people who live in that culture. Children are part of both a broader culture (such as Western culture) and members of one or more subcultures (for instance, Mexican American subculture).

- Finally, the *chronosystem* underlies each of the previous systems. It involves the way the passage of time—including historical events (such as the terrorist attacks in September of 2001) and more gradual historical changes (such as changes in the number of women who work outside the home)—affects children's development.

The bioecological approach emphasizes the *interconnectedness of the influences on development.* Because the various levels are related to one another, a change in one part of the system affects other parts. For instance, a parent's loss of a job (involving the mesosystem) has an impact upon a child's microsystem.

Conversely, changes on one environmental level may make little difference if other levels are not also changed. For instance, improving the school environment may have a negligible effect on academic performance if children receive little support for academic success at home. Similarly, the influences among family members are multidirectional. Parents don't just influence their child's behavior—the child also influences the parents' behavior.

Finally, the bioecological approach stresses the importance of broad cultural factors that affect development. Researchers in lifespan development increasingly look at how membership in cultural groups influences behavior.

Consider, for instance, whether you agree that children should be taught that their classmates' assistance is essential to getting good grades in school, or that they should plan to continue their fathers' businesses, or that they should take their parents' advice in choosing a career. If you have been raised in the most widespread North American culture, you would likely disagree with all three statements, since they violate the premises of *individualism,* the dominant Western philosophy that emphasizes personal identity, uniqueness, freedom, and the worth of the individual.

On the other hand, if you were raised in a traditional Asian culture, your agreement with the three statements is considerably more likely because the statements reflect the value orientation known as collectivism. *Collectivism* is the notion that the well-being of the group is more important than that of the individual. People raised in collectivistic cultures sometimes emphasize the welfare of the group at the expense of their own personal well-being.

The individualism–collectivism spectrum is one of several dimensions along which cultures differ, and it illustrates differences in the cultural contexts in which people operate. Such broad cultural values play an important role in shaping the ways people view the world and behave (Garcia & Saewyc, 2007; Yu & Stiffman, 2007; Boles, Le, & Nguyen, 2010).

Assessing the Bioecological Approach.   Although Bronfenbrenner regards biological influences as an important component of the bioecological approach, ecological influences are central to the theory. In fact, some critics argue that the perspective pays insufficient attention to biological factors. Still, the bioecological approach is important because it suggests the multiple levels at which the environment affects children's development.

Vygotsky's Sociocultural Theory.   To Russian developmentalist Lev Semenovich Vygotsky, a full understanding of development is impossible without taking into account the culture in which

According to Vygotsky, children can develop cognitively in their understanding of the world, and learn what is important in society, through play and cooperation with others.

people develop. Vygotsky's **sociocultural theory** emphasizes how cognitive development proceeds as a result of social interactions between members of a culture (Vygotsky, 1979, 1926/1997; Beilin, 1996; Winsler, 2003; Edwards, 2005; Ferholt & Lecusay, 2010).

Vygotsky, who lived a brief life, from 1896 to 1934, argued that children's understanding of the world is acquired through their problem-solving interactions with adults and other children. As children play and cooperate with others, they learn what is important in their society and, at the same time, advance cognitively. Consequently, to understand development, we must consider what is meaningful to members of a given culture.

More than most other theories, sociocultural theory emphasizes that development is a *reciprocal transaction* between the people in a child's environment and the child. Vygotsky believed that people and settings influence the child, who in turn influences the people and settings. This pattern continues in an endless loop, with children being both recipients of socialization influences and sources of influence. For example, a child raised with his or her extended family nearby will grow up with a different sense of family life than a child whose relatives live far away. Those relatives, too, are affected by that situation and that child, depending upon how close and frequent their contact is with the child.

Assessing Vygotsky's Theory. Sociocultural theory has become increasingly influential, despite Vygotsky's death almost eight decades ago. The reason is the growing acknowledgment of the central importance of cultural factors in development. Children do not develop in a cultural vacuum. Instead, their attention is directed by society to certain areas, and as a consequence, they develop particular kinds of skills. Vygotsky was one of the first developmentalists to recognize and acknowledge the importance of the cultural environment, and—as today's society becomes increasingly multicultural—sociocultural theory helps us to understand the rich and varied influences that shape development (Fowers & Davidov, 2006; Koshmanova, 2007; Rogan, 2007).

Sociocultural theory is not without its critics, however. Some suggest that Vygotsky's strong emphasis on the role of culture and social experience led him to ignore the effects of biological factors on development. In addition, his perspective seems to minimize the role that individuals play in shaping their environment.

Evolutionary Perspectives: Our Ancestors' Contributions to Behavior

One increasingly influential approach is the evolutionary perspective, the sixth and final developmental perspective that we will consider. The **evolutionary perspective** seeks to identify behavior that is the result of our genetic inheritance from our ancestors (Buss & Kern, 2003; Bjorklund, 2005; Goetz & Shackelford, 2006).

Evolutionary approaches grow out of the groundbreaking work of Charles Darwin. In 1859, Darwin argued in *On the Origin of Species* that a process of natural selection creates traits in a species that are adaptive to its environment. Using Darwin's arguments, evolutionary approaches contend that our genetic inheritance not only determines such physical traits as skin and eye color, but certain personality traits and social behaviors as well. For instance, some evolutionary developmentalists suggest that behaviors such as shyness and jealousy are produced in part by genetic causes, presumably because they helped in increasing survival rates of humans' ancient relatives (Easton, Schipper, & Shackelford, 2007; Buss, 2003, 2009).

The evolutionary perspective draws heavily on the field of *ethology,* which examines the ways in which our biological makeup influences our behavior. A primary proponent of ethology was Konrad Lorenz (1903–1989), who discovered that newborn geese are genetically preprogrammed to become attached to the first moving object they see after birth. His work, which demonstrated the importance of biological determinants in influencing behavior

sociocultural theory the approach that emphasizes how cognitive development proceeds as a result of social interactions between members of a culture

evolutionary perspective the theory that seeks to identify behavior that is a result of our genetic inheritance from our ancestors

patterns, led developmentalists to consider the ways in which human behavior might reflect inborn genetic patterns.

The evolutionary perspective encompasses one of the fastest growing areas within the field of lifespan development: behavioral genetics. *Behavioral genetics* studies the effects of heredity on behavior. Behavioral geneticists seek to understand how we might inherit certain behavioral traits and how the environment influences whether we actually display those traits. It also considers how genetic factors may produce psychological disorders such as schizophrenia (Li, 2003; Bjorklund & Ellis, 2005; Rembis, 2009).

Assessing the Evolutionary Perspective. There is little argument among lifespan developmentalists that Darwin's evolutionary theory provides an accurate description of basic genetic processes, and the evolutionary perspective is increasingly visible in the field of lifespan development. However, applications of the evolutionary perspective have been subjected to considerable criticism.

Konrad Lorenz, seen here with geese who from their birth have followed him, considered the ways in which behavior reflects inborn genetic patterns.

Some developmentalists are concerned that because of its focus on genetic and biological aspects of behavior, the evolutionary perspective pays insufficient attention to the environmental and social factors involved in producing children's and adults' behavior. Other critics argue that there is no good way to experimentally test theories derived from this approach because humans evolved so long ago. For example, it is one thing to say that jealousy helped individuals to survive more effectively and another thing to prove it. Still, the evolutionary approach has stimulated research on how our biological inheritance influences at least partially our traits and behaviors (Buss & Reeve, 2003; Bjorklund, 2006; Baptista et al., 2008).

Why "Which Approach Is Right?" Is the Wrong Question

We have considered the six major perspectives on development—psychodynamic, behavioral, cognitive, humanistic, contextual, and evolutionary—summarized in Table 1-3 and applied to a specific case. It would be natural to wonder which of the six provides the most accurate account of human development.

For several reasons, this is not an appropriate question. For one thing, each perspective emphasizes different aspects of development. For instance, the psychodynamic approach emphasizes unconscious determinants of behavior, while behavioral perspectives emphasize overt behavior. The cognitive and humanistic perspectives look more at what people *think* than at what they do. The contextual perspective examines social and cultural influences on development, and the evolutionary perspective focuses on how inherited biological factors underlie development.

For example, a developmentalist using the psychodynamic approach might consider how the 9/11 terrorist attacks on the World Trade Center and Pentagon might affect children, unconsciously, for their entire life span. A cognitive approach might focus on how children perceived and came to interpret and understand terrorism, while a contextual approach might consider what personality and social factors led the perpetrators to adopt terrorist tactics.

Clearly, each perspective is based on its own premises and focuses on different aspects of development. Furthermore, the same developmental phenomenon can be looked at from a number of perspectives simultaneously. In fact, some lifespan developmentalists use an *eclectic* approach, drawing on several perspectives simultaneously.

In the same way, the various theoretical perspectives provide different ways of looking at development. Considering them together paints a fuller portrait of the myriad ways human beings change and grow over the course of their lives. However, not all theories and claims derived from the various perspectives are accurate. How do we choose among competing explanations? The answer can be found through *research,* which we consider in the final part of this chapter.

TABLE 1-3 MAJOR PERSPECTIVES ON LIFESPAN DEVELOPMENT

Perspective	Key Ideas About Human Behavior and Development	Major Proponents	Example
Psychodynamic	Behavior throughout life is motivated by inner, unconscious forces, stemming from childhood, over which we have little control.	Sigmund Freud, Erik Erikson	This view might suggest that a young adult who is overweight has a fixation in the oral stage of development.
Behavioral	Development can be understood through studying observable behavior and environmental stimuli.	John B. Watson, B. F. Skinner, Albert Bandura	In this perspective, a young adult who is overweight might be seen as not being rewarded for good nutritional and exercise habits.
Cognitive	Emphasis on how changes or growth in the ways people know, understand, and think about the world affect behavior.	Jean Piaget	This view might suggest that a young adult who is overweight hasn't learned effective ways to stay at a healthy weight and doesn't value good nutrition.
Humanistic	Behavior is chosen through free *will* and motivated by our natural capacity to strive to reach our full potential.	Carl Rogers, Abraham Maslow	In this view, a young adult who is overweight may eventually choose to seek an optimal weight as part of an overall pattern of individual growth.
Contextual	Development should be viewed in terms of the interrelationship of a person's physical, cognitive, personality, and social worlds.	Urie Bronfenbrenner, Lev Vygotsky	In this perspective, being overweight is caused by a number of interrelated factors in that person's physical, cognitive, personality, and social worlds.
Evolutionary	Behavior is the result of genetic inheritance from our ancestors; traits and behavior that are adaptive for promoting the survival of our species have been inherited through natural selection.	Influenced by early work of Charles Darwin, Konrad Lorenz	This view might suggest that a young adult might have a genetic tendency toward obesity because extra fat helped his or her ancestors to survive in times of famine.

REVIEW, CHECK, AND APPLY

REVIEW

LO7 What are the main characteristics of the humanistic, contextual, and evolutionary perspectives?

- The humanistic perspective maintains that individuals have the ability and motivation to reach advanced levels of maturity and that people naturally seek to reach their full potential.
- The contextual perspective considers the relationship between individuals and their physical, cognitive, personality, and social worlds. Bronfenbrenner's bioecological approach and Vygotsky's sociocultural theory fall into this category.
- The evolutionary perspective attempts to identify behavior that is a result of our genetic inheritance.

LO8 Why is there no "right" approach to development?

- The theoretical perspectives provide different ways of looking at development. Considering them together paints a fuller portrait of the myriad ways human beings change and grow over the course of their lives.
- However, not all theories and claims derived from the various perspectives are accurate.

CHECK YOURSELF

1. According to the humanistic perspective, people reject the urge to seek love and respect from others and strive to achieve personal independence free of societal interconnections.
   - True
   - False

2. Bronfenbrenner's bioecological approach and Vygotsky's sociocultural theory fall under the category of the _____ perspective.
   a. humanistic
   b. ethnological
   c. contextual
   d. evolutionary

3. The researcher most closely associated with the evolutionary perspective is:
   a. Konrad Lorenz.
   b. Jean Piaget.
   c. Carl Rogers
   d. B. F. Skinner

APPLYING LIFESPAN DEVELOPMENT

- Can you think of people you have known who exhibited distinct signs of being in a stage of psychosocial development discussed by Erikson? What stage were they in and what were the signs?

✓•—**Study** and **Review** on **MyDevelopmentLab.com**

Answers: 1) False; 2) c; 3) a

MODULE 1.3 Research Methods

The Egyptians had long believed that they were the most ancient race on earth, and Psamtik [King of Egypt in the seventh century, B.C.], driven by intellectual curiosity, wanted to prove that flattering belief. Like a good researcher, he began with a hypothesis: If children had no opportunity to learn a language from older people around them, they would spontaneously speak the primal, inborn language of humankind—the natural language of its most ancient people—which, he expected to show, was Egyptian.

To test his hypothesis, Psamtik commandeered two infants of a lower-class mother and turned them over to a herdsman to bring up in a remote area. They were to be kept in a sequestered cottage, properly fed and cared for, but were never to hear anyone speak so much as a word. The Greek historian Herodotus, who tracked the story down and learned what he calls "the real facts" from priests of Hephaestus in Memphis, says that Psamtik's goal "was to know, after the indistinct babblings of infancy were over, what word they would first articulate."

The experiment, he tells us, worked. One day, when the children were two years old, they ran up to the herdsman as he opened the door of their cottage and cried out "Becos!" Since this meant nothing to him, he paid no attention, but when it happened repeatedly, he sent word to Psamtik, who at once ordered the children brought to him. When he too heard them say it, Psamtik made inquiries and learned that becos was the Phrygian word for bread. He concluded that, disappointingly, the Phrygians were an older race than the Egyptians. (Hunt, 1993, pp. 1–2)

With the perspective of several thousand years, we can easily see the shortcomings—both scientific and ethical—in Psamtik's approach. Yet his procedure represents an improvement over mere speculation, and as such is sometimes looked upon as the first developmental experiment in recorded history (Hunt, 1993).

Theories, Hypotheses, and Correlational Studies

LO9 What roles do theories and hypotheses play in the study of development?

LO10 What sorts of studies and methods are used in correlational research?

Theories and Hypotheses: Posing Developmental Questions

Questions such as those raised by Psamtik drive the study of development. In fact, developmentalists are still studying how children learn language. Others are working on such questions as, What are the effects of malnutrition on intellectual performance? How do infants form relationships with their parents, and does day care disrupt such relationships? Why are adolescents particularly susceptible to peer pressure? Can mentally challenging activities reduce the declines in intellectual abilities related to aging? Do any mental faculties improve with age?

To answer such questions, developmentalists, like all psychologists and other scientists, rely on the scientific method. The **scientific method** is the process of posing and answering questions using careful, controlled techniques that include systematic, orderly observation and the collection of data. The scientific method involves three major steps: (1) identifying questions of interest, (2) formulating an explanation, and (3) carrying out research that either lends support to the explanation or refutes it.

The scientific method involves the formulation of **theories,** broad explanations, and predictions about phenomena of interest. For instance, the idea that there is a crucial bonding period between parent and child immediately after birth is a theory.

scientific method the process of posing and answering questions using careful, controlled techniques that include systematic, orderly observation and the collection of data

theories broad explanations, and predictions about phenomena of interest

hypothesis a prediction stated in a way that permits it to be tested

correlational research research that seeks to identify whether an association or relationship between two factors exists

experimental research research designed to discover causal relationships between various factors

Developmental researchers use theories to form hypotheses. A **hypothesis** is a prediction stated in a way that permits it to be tested. For instance, someone who subscribes to the general theory that bonding is crucial might derive the hypothesis that effective bonding occurs only if it lasts for a certain length of time.

Choosing a Research Strategy: Answering Questions

Once researchers have formed a hypothesis, they must develop a research strategy to test its validity. There are two major categories of research: correlational research and experimental research. Correlational research seeks to identify whether an association or relationship between two factors exists. As we'll see, **correlational research** cannot determine whether one factor *causes* changes in the other. For instance, correlational research could tell us if there is an association between the number of minutes a mother and her newborn child are together immediately after birth and the quality of the mother–child relationship when the child reaches age 2. Such correlational research indicates whether the two factors are *associated* or *related* to one another, but not whether the initial contact caused the relationship to develop in a particular way (Schutt, 2001).

In contrast, **experimental research** is designed to discover *causal* relationships between various factors. In experimental research, researchers deliberately introduce a change in a carefully structured situation in order to see the consequences of that change. For instance, a researcher conducting an experiment might vary the number of minutes that mothers and children interact immediately following birth, in an attempt to see whether the bonding time affects the mother–child relationship.

Because experimental research is able to answer questions of causality, it is fundamental to finding answers to various developmental hypotheses. However, some research questions cannot be answered through experiments, for either technical or ethical reasons (for example, it would be unethical to design an experiment in which a group of infants was offered no chance to bond with a caregiver at all). In fact, a great deal of pioneering developmental research—such as that conducted by Piaget and Vygotsky—employed correlational techniques. Consequently, correlational research remains an important tool for developmental researchers.

Correlational Studies

As we've noted, correlational research examines the relationship between two variables to determine whether they are associated, or *correlated*. For instance, researchers interested in the relationship between televised aggression and subsequent behavior have found that children who watch a good deal of aggression on television—murders, crime shows, shootings, and the like—tend to be more aggressive than those who watch only a little. In other words, viewing aggression and actual aggression are strongly associated, or correlated (Center for Communication & Social Policy, 1998; Singer & Singer, 2000; Feshbach & Tangney, 2008; Coyne et al., 2010).

But can we conclude that the viewing of televised aggression *causes* the more aggressive behavior? Not at all. Consider some of the other possibilities: It might be that being aggressive in the first place makes children more likely to choose to watch violent programs. In this case, the aggressive tendency causes the viewing behavior, not the other way around.

Or consider that there may be a *third* factor operating on both the viewing and the aggression. Suppose, for example, that children of lower socioeconomic status are more likely to behave aggressively *and* to watch higher levels of aggressive television than those raised in more affluent settings. In this case, the third variable—socioeconomic status—causes *both* the aggressive behavior and the television viewing. (The various possibilities are illustrated in Figure 1-2).

In short, finding that two variables are correlated proves nothing about causality. Although the variables may be linked causally, this is not necessarily the case.

Correlational studies do provide important information, however. For instance, as we'll see in later chapters, we know from correlational studies that the closer the genetic link between two people, the more highly associated is their intelligence. We have learned that the more parents speak to their young children, the more extensive are the children's vocabularies. And
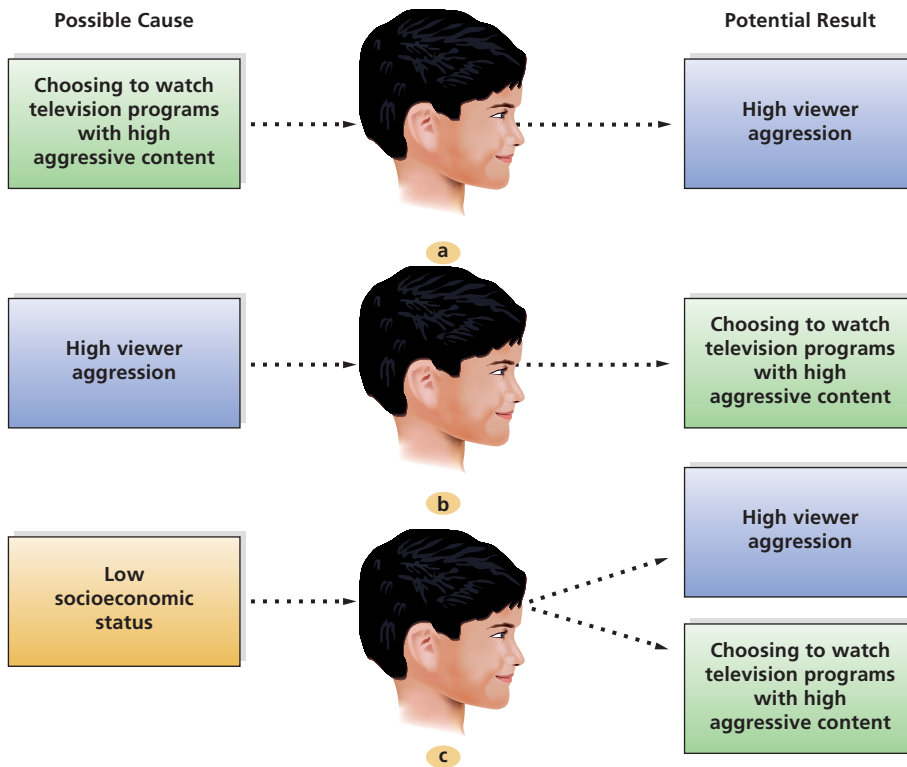
Possible Cause   Potential Result

| Choosing to watch television programs with high aggressive content | | High viewer aggression |

a

| High viewer aggression | | Choosing to watch television programs with high aggressive content |

b

| Low socioeconomic status | | High viewer aggression |
| | | Choosing to watch television programs with high aggressive content |

c

FIGURE 1-2 Finding a Correlation
Finding a correlation between two factors does not imply that one factor *causes* the other factor to vary. For instance, suppose a study found that viewing television shows with high levels of aggression is correlated with actual aggression in children. The correlation may reflect at least three possibilities: (a) watching television programs containing high levels of aggression causes aggression in viewers; (b) children who behave aggressively choose to watch TV programs with high levels of aggression; or (c) some third factor, such as a child's socioeconomic status, leads both to high viewer aggression and to choosing to watch television programs with high viewer aggression. What other factors, besides socioeconomic status, might be plausible third factors?

we know from correlational studies that the better the nutrition that infants receive, the fewer the cognitive and social problems they experience later (Hart, 2004; Colom, Lluis-Font, & Andrés-Pueyo, 2005; Robb, Richert, & Wartella, 2009).

The Correlation Coefficient. The strength and direction of a relationship between two factors is represented by a mathematical score, called a *correlation coefficient*, that ranges from +1.0 to −1.0. A *positive* correlation indicates that as the value of one factor increases, it can be predicted that the value of the other will also increase. For instance, if we administer a job satisfaction survey and find that the more money people make in their first job, the higher their job satisfaction, and the less money they make the lower their job satisfaction, we have found a positive correlation The correlation coefficient would be indicated by a positive number, and the stronger the association between salary and job satisfaction, the closer the number would be to +1.0.

In contrast, a correlation coefficient with a *negative* value informs us that as the value of one factor increases, the value of the other factor declines. For example, suppose we found that the more time adolescents spend using instant messaging on their computers, the worse their academic performance is. This would produce a negative correlation, a number between 0 and −1. More instant messaging would be associated with lower performance, and less instant messaging with higher performance. The stronger the association between instant messaging and school performance, the closer the correlation coefficient will be to −1.0.

naturalistic observation a type of correlational study in which some naturally occurring behavior is observed without intervention in the situation

case studies studies that involve extensive, in-depth interviews with a particular individual or small group of individuals

survey research a type of study where a group of people chosen to represent some larger population are asked questions about their attitudes, behavior, or thinking on a given topic

psychophysiological methods research that focuses on the relationship between physiological processes and behavior
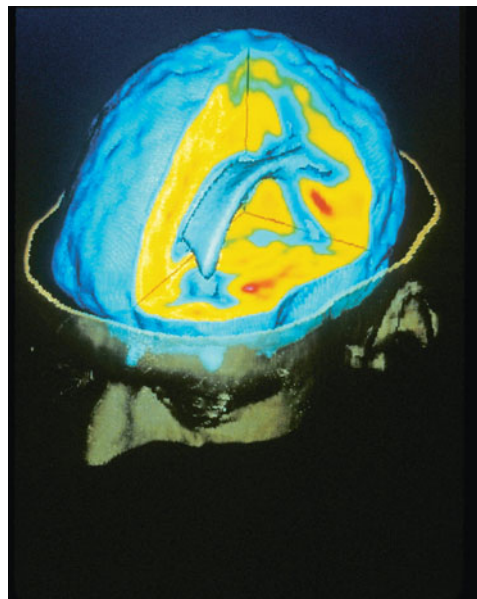
Finally, it may be that two factors are unrelated to one another. For example, it is unlikely that we would find a correlation between school performance and shoe size. In this case, the lack of a relationship would be indicated by a correlation coefficient close to 0.

It is important to repeat that, even if a correlation coefficient is very strong, there is no way we can know whether one factor *causes* the other factor to vary. It simply means that the two factors are associated with one another in a predictable way.

Types of Correlational Studies. There are several types of correlational studies. **Naturalistic observation** is the observation of a naturally occurring behavior without intervention. For instance, an investigator who wishes to learn how often preschool children share toys might observe a classroom over a 3-week period, recording how often the preschoolers spontaneously share with one another. The key point is that the investigator observes without interfering (e.g., Beach, 2003; Prezbindowski & Lederberg, 2003; Mortensen & Cialdini, 2010).

Though naturalistic observation has the advantage of identifying what children do in their "natural habitat," there is an important drawback to the method: Researchers are unable to exert control over factors of interest. For instance, in some cases researchers might find so few naturally occurring instances of the behavior of interest that they are unable to draw any conclusions at all.

Ethnography and qualitative research. Increasingly, naturalistic observation employs *ethnography,* a method that borrows from anthropology and is used to investigate cultural questions. In ethnography, the goal is to understand a culture's values and attitudes through careful, extended examination. Typically, researchers act as participant observers, living for a period of weeks, months, or even years in another culture. By carefully observing everyday life and conducting in-depth interviews, researchers can obtain a deep understanding of life within another culture (Dyson, 2003).

Ethnographic studies are an example of a broader category of research known as qualitative research. In *qualitative research,* researchers choose particular settings of interest and seek to carefully describe, in narrative fashion, what is occurring, and why. Qualitative research can be used to generate hypotheses that can later be tested using more objective, quantitative methods.

Although ethnographic and qualitative studies provide a fine-grained view of behavior in particular settings, they suffer from several drawbacks. As mentioned, the presence of a participant observer may influence the behavior of the individuals being studied. Furthermore, because only a small number of individuals are studied, it may be hard to generalize the findings to other settings. Finally, ethnographers carrying out cross-cultural research may misinterpret and misconceive what they are observing, particularly in cultures that are very different from their own (Polkinghome, 2005).

Case studies involve extensive, in-depth interviews with a particular individual or small group of individuals. They often are used not just to learn about the individual being interviewed, but to derive broader principles or draw tentative conclusions that might apply to others. For example, case studies have been conducted on children who display unusual genius and on children who have spent their early years in the wild, apparently without human contact. These case studies have provided important information to researchers, and have suggested hypotheses for future investigation (Cohen & Cashon, 2003; Wilson, 2003; Ng & Nicholas, 2010).

Using *diaries,* participants are asked to keep a record of their behavior on a regular basis. For example, a group of adolescents may be asked to record each time they interact with friends for more than 5 minutes, thereby providing a way to track their social behavior.

Surveys represent another sort of correlational research. In **survey research,** a group of people chosen to represent some larger population are asked questions about their attitudes, behavior, or thinking on a given topic. For instance, surveys have been conducted about parents' use of punishment on their children and on attitudes toward breastfeeding. From the responses, inferences are drawn regarding the larger population represented by the individuals being surveyed.

Psychophysiological Methods. Some developmental researchers, particularly those using a cognitive neuroscience approach, make use of psychophysiological methods. **Psychophysiological methods** focus on the relationship between physiological processes and

This fMRI shows activity in different regions of the brain.

behavior. For instance, a researcher might examine the relationship between blood flow in the brain and problem-solving ability. Similarly, some studies use infants' heart rate as a measure of their interest in stimuli to which they are exposed (Santesso, Schmidt, & Trainor, 2007; Field, Diego, & Hernandez-Reif, 2009; Mazoyer et al., 2009).

Among the most frequently used psychophysiological measures:

- **Electroencephalogram (EEG).** The EEG uses electrodes placed on the skull to record electrical activity in the brain. The brain activity is transformed into a pictorial representation of brain wave patterns, permitting the diagnosis of disorders such as epilepsy and learning disabilities.

- **Computerized axial tomography (CAT) scan.** In a CAT scan, a computer constructs an image of the brain by combining thousands of individual x-rays taken at slightly different angles. Although it does not show brain activity, it does illuminate the structure of the brain.

- **Functional magnetic resonance imaging (fMRI) scan.** An fMRI provides a detailed, three-dimensional computer-generated image of brain activity by aiming a powerful magnetic field at the brain. It offers one of the best ways of learning about the operation of the brain, down to the level of individual nerves.

REVIEW, CHECK, AND APPLY

REVIEW

LO9   What roles do theories and hypotheses play in the study of development?

- Theories are systematically derived explanations of facts or phenomena.
- Theories suggest hypotheses, which are predictions that can be tested.

LO10   What sorts of studies and methods are used in correlational research?

- Correlational studies examine the relationship, or correlation, between two factors without demonstrating causality.
- Correlational methods include naturalistic observation, ethnography, case studies, survey research, and psychophysiological methods.

CHECK YOURSELF

1. Consider the following steps of the scientific method and rank them from first to last.

_____ Formulating an explanation.

_____ Carrying out research that either lends support to the explanation or refutes it.

_____ Identifying questions of interest.

2. In order to make a prediction in such a way that permits it to be tested, one must make a(n) _____.

   a. theory
   b. hypothesis
   c. analysis
   d. judgment

3. A researcher stands near an intersection and writes down the time it takes for the lead driver to start up after the light turns green. The researcher records the gender and approximate age of the driver. This researcher is most likely engaged in:

   a. a case study.
   b. naturalistic observation.
   c. an ethnography.
   d. survey research.

4. Researchers using correlational methods typically use a study group and a control group to isolate cause-and-effect relationships.

   - True
   - False

APPLYING LIFESPAN DEVELOPMENT

- Formulate a theory about one aspect of human development and a hypothesis that relates to it.

✔●─ **Study** and **Review** on
MyDevelopmentLab.com

Answers: 1) 2, 3, 1; 2) b; 3) b; 4) False

Experiments: Determining Cause and Effect

LO11 What are the characteristics of experimental research?

LO12 Why is it important to think critically about "expert" advice?

In an **experiment,** an investigator or experimenter typically devises two different conditions (or *treatments*) and then compares how the behavior of the participants exposed to each condition is affected. One group, the *treatment* or *experimental group,* is exposed to the treatment variable being studied; the other, the *control group*, is not.

For instance, suppose you want to see if exposure to movie violence makes viewers more aggressive. You might show a group of adolescents a series of movies with a great deal of violent imagery. You would then measure their subsequent aggression. This group would constitute the treatment group. For the control group you might show a second group of adolescents movies that contain no violent imagery, and measure their subsequent aggression. By comparing the amount of aggression displayed by members of the treatment and control groups, you would be able to determine if exposure to violent imagery produces aggression in viewers. In fact, this describes an experiment conducted at the University of Louvain in Belgium. Psychologist Jacques-Philippe Leyens and colleagues found that the level of aggression rose significantly for the adolescents who had seen the movies containing violence (Leyens et al., 1975).

The central feature of this experiment—and all experiments—is the comparison of the consequences of different treatments. The use of both treatment and control groups allows researchers to rule out the possibility that something other than the experimental manipulation produced the results found in the experiment. For instance, if a control group was not used, experimenters could not be certain that some other factor, such as the time of day the movies were shown or even the mere passage of time, produced the observed changes. By using a control group, experimenters can draw accurate conclusions about causes and effects.

Independent and Dependent Variables. The **independent variable** is the variable that researchers manipulate in the experiment (in our example, it is the type of movie participants saw—violent or non-violent). In contrast, the **dependent variable** is the variable that researchers measure to see if it changes as a result of the experimental manipulation. In our example, the degree of aggressive behavior shown by the participants after viewing violent or non-violent films is the dependent variable. (One way to remember the difference: A hypothesis predicts how a dependent variable *depends* on the manipulation of the independent variable.) Every experiment has an independent and dependent variable.

Experimenters must make sure their studies are not influenced by factors other than those they are manipulating. For this reason, they take great care to make sure that the participants in both the treatment and control groups are not aware of the purpose of the experiment (which could affect their responses or behavior) and that the experimenters do not influence who is chosen for the control and treatment groups. The procedure that is used for this is known as random assignment. In *random assignment,* participants are assigned to different experimental groups or "conditions" purely on the basis of chance. This way the laws of statistics ensure that personal characteristics that might affect the outcome of the experiment are divided proportionally among the participants in the different groups, making the groups equivalent. Equivalent groups achieved by random assignment allow an experimenter to draw conclusions with confidence.

Figure 1-3 illustrates the Belgian experiment on adolescents exposed to films containing violent or non-violent imagery, and the effects of such imagery on subsequent aggressive behavior. As you can see, it contains each of the elements of an experiment:

- An independent variable (the assignment to a violent or nonviolent film condition)
- A dependent variable (measurement of the adolescents' aggressive behavior)
- Random assignment to condition (viewing a film with violent imagery versus a film with nonviolent imagery)
- A hypothesis that predicts the effect the independent variable will have on the dependent variable (that viewing a film with violent imagery will produce subsequent aggression)

experiment a process in which an investigator, called an experimenter, devises two different experiences for participants

independent variable the variable that researchers manipulate in an experiment

dependent variable the variable that researchers measure to see if it changes as a result of the experimental manipulation

(a) Identify participants

(b) Randomly assign participants to a condition

(c) Manipulate the independent variable

(d) Measure the dependent variable (aggression displayed by participants)

(e) Compare the results of the two groups

Group 1: Treatment group

Observe film with aggressive imagery

Group 2: Control group
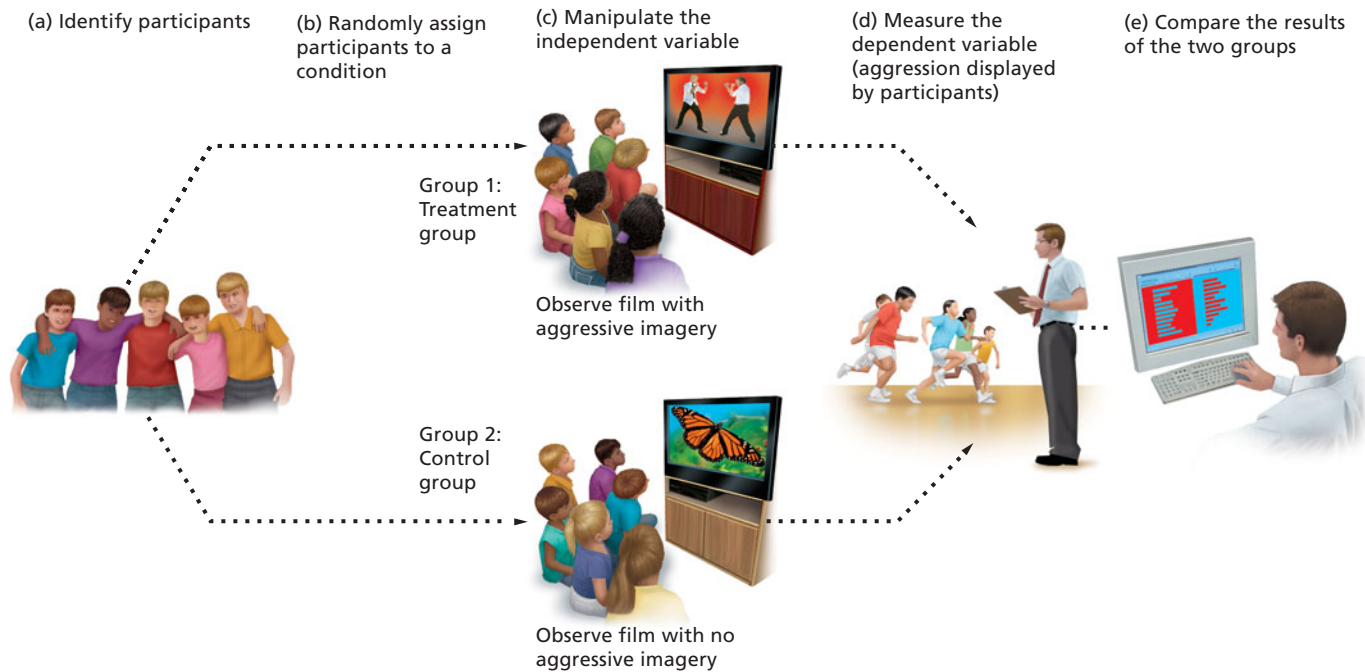
Observe film with no aggressive imagery

FIGURE 1-3 Elements of an Experiment
In this experiment, researchers randomly assigned a group of adolescents to one of two conditions: viewing a film that contained violent imagery, or viewing a film that lacked violent imagery (manipulation of the independent variable). Then participants were observed later to determine how much aggression they showed (the dependent variable). Analysis of the findings showed that adolescents exposed to aggressive imagery showed more aggression later. (Based on an experiment by Leyens et al., 1975)

Given the advantage of experiments—that they provide a means of determining causality—why aren't experiments always used? The answer is that there are some situations that a researcher, no matter how ingenious, simply cannot control. And there are some situations in which control would be unethical, even if it were possible. For instance, no researcher would be able to assign different groups of infants to parents of high and low socioeconomic status in order to learn the effects of such status on subsequent development. In situations in which experiments are logistically or ethically impossible, developmentalists employ correlational research.

Furthermore, keep in mind that a single experiment is insufficient to answer a research question definitively. Before complete confidence can be placed in a conclusion, research must be *replicated*, or repeated, sometimes using other procedures and techniques with other participants. Sometimes developmentalists use a procedure called *meta-analysis,* which permits the combination of results of many studies into one overall conclusion (Peterson & Brown, 2005; Le et al., 2010).

Choosing a Research Setting. Deciding *where* to conduct a study may be as important as determining *what* to do. In the Belgian experiment on the influence of exposure to media aggression, the researchers used a real-world setting—a group home for boys who had been convicted of juvenile delinquency. They chose this **sample,** the group of participants chosen for the experiment, because it was useful to have adolescents whose normal level of aggression was relatively high, and because they could incorporate the films into the everyday life of the home with minimal disruption.

Using a real-world setting (as in the aggression experiment) is the hallmark of a field study. A **field study** is a research investigation carried out in a naturally occurring setting. Field studies capture behavior in real-life settings, where research participants may behave more naturally than in a laboratory.

Field studies may be used in both correlational studies and experiments. They typically employ naturalistic observation, the technique in which researchers observe a naturally occurring behavior without intervening or changing the situation. A researcher might

sample the group of participants chosen for the experiment

field study a research investigation carried out in a naturally occurring setting

In experimental research, developmentalists use controlled conditions to discover causal relationships between various factors.

examine behavior in a child-care center, view the groupings of adolescents in high school corridors, or observe elderly adults in a senior center.

Because it is often difficult to control the situation and environment enough to run an experiment in a real-world setting, field studies are more typical of correlational designs than experimental designs. Most developmental research experiments are conducted in laboratory settings. A **laboratory study** is a research investigation conducted in a controlled setting explicitly designed to hold events constant. The laboratory may be a room or building designed for research, as in a university psychology department. Their ability to control the settings in laboratory studies enables researchers to learn more clearly how their treatments affect participants.

Theoretical and Applied Research: Complementary Approaches

Developmental researchers typically focus on either theoretical research or applied research. **Theoretical research** is designed to test some developmental explanation and expand scientific knowledge, while **applied research** is meant to provide practical solutions to immediate problems. For instance, if we were interested in the processes of cognitive change during childhood, we might carry out a study of how many digits children of various ages can remember after one exposure to multidigit numbers—a theoretical approach. Alternatively, we might focus on the more practical question of how teachers can help children to remember information more easily. Such a study would represent applied research, because the findings are applied to a particular setting and problem.

There is not always a clear distinction between theoretical and applied research. For instance, is a study that examines the consequences of ear infections in infancy on later hearing loss theoretical or applied? Because such a study may help illuminate the basic processes involved in hearing, it can be considered theoretical. But if it helps to prevent hearing loss, it may be considered applied (Lerner, Fisher, & Weinberg, 2000).

In fact, as we discuss in the accompanying "From Research to Practice" box, research of both a theoretical and applied nature has played a significant role in shaping and resolving a variety of public policy questions.

Measuring Developmental Change

How people grow and change through the life span is central to the work of all developmental researchers. Consequently, one of the thorniest research issues they face concerns the measurement of change and differences over age and time. To solve this problem, researchers have developed three major research strategies: longitudinal research, cross-sectional research, and sequential research.

Longitudinal Studies: Measuring Individual Change. If you were interested in learning how a child develops morally between 3 and 5, the most direct approach would be to take a group of 3-year-olds and follow them until they were 5, testing them periodically.

This strategy illustrates longitudinal research. In **longitudinal research,** the behavior of one or more study participants is measured as they age. Longitudinal research measures change over time. By following many individuals over time, researchers can understand the general course of change across some period of life.

The granddaddy of longitudinal studies, which has become a classic, is a study of gifted children begun by Lewis Terman about 80 years ago. In the study—which has yet to be concluded—a group of 1,500 children with high IQs were tested about every 5 years. Now in their 80s, the participants—who call themselves "Termites"—have provided information on everything from intellectual accomplishment to personality and longevity (Feldhusen, 2003; McCullough, Tsang, & Brion, 2003; Subotnik, 2006).

Longitudinal research has also provided insight into language development. For instance, by tracing how children's vocabularies increase on a day-by-day basis, researchers have been

laboratory study a research investigation conducted in a controlled setting explicitly designed to hold events constant

theoretical research research designed specifically to test some developmental explanation and expand scientific knowledge

applied research research meant to provide practical solutions to immediate problems

longitudinal research research in which the behavior of one or more participants in a study is measured as they age