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Basic Issues in the Study of Development

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Issues in the Study of Development

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When it comes to child and adolescent development, you have a great deal of personal experience. For one thing, you had a childhood and an adolescence of your own, and you have had many opportunities to observe children and teens as well as the parents, teachers, and others who are responsible for children's upbringing. Information media such as books, movies, television shows, and the Internet have provided you with additional insights into the trials

developmental science The study of age-related changes in behavior, thinking, emotions, and social relationships.

and tribulations of development that go beyond your own personal experiences. As a result, you have probably formed several beliefs about development that you regard as absolutely true.

Think about what you believe to be true beyond dispute about sibling relationships. Here are a few ideas:

Siblings always fight.
Siblings of the same gender fight more than opposite gender siblings do.
Sibling fights are usually sparked by jealousy—"Mom loves you best."

Watson, J. B. (1930). *Behaviorism.* New York: Norton

You may be so sure that these propositions are true that you will find it shocking that, as the aptly named best-selling book ***Nurture Shock*** (Bronson & Merryman, 2009) pointed out, research does not support any of them. The truth is that the degree of conflict between siblings depends on a lot of factors and, consequently, varies considerably from one family to another. Moreover, brother-brother and sister-sister siblings don't fight any more or less than brother-sister pairs do. And competition for parental affection is rarely the cause of sibling conflict.

Our purpose in drawing attention to sibling relationships here is to spark your curiosity about how well so-called "common sense" thinking about developmental psychology corresponds to the science of developmental psychology.

As you work your way through the chapters of this text, you will no doubt encounter many research findings that will challenge your beliefs. But we want you to keep in mind that the goal of developmental psychologists isn't simply to cause people to question and alter their beliefs. Instead, developmentalists seek to understand the processes that underlie human development and to find ways to help parents, teachers, therapists, and others who work with children do so effectively. To that end, they develop theories and conduct research aimed at describing, explaining, predicting, and influencing development.

Issues in the Study of Development

Centuries before researchers began to use scientific methods to study age-related changes, philosophers proposed explanations of development based on everyday observations. Many of their questions and assertions about the nature of human development continue to be central to modern-day **developmental science**. Watch at MyDevelopmentLab

Watch the Video *So Much to Choose from* at MyDevelopmentLab

Learning Objective 1
What answers have been proposed to the nature-nurture and continuity-discontinuity questions?

Two Key Questions

Two important questions have shaped the scientific study of child development. First, philosophers and scientists alike have debated the degree to which inborn tendencies and environmental factors influence development. Second, there are differing opinions as to whether age-related change occurs in stages.

THE NATURE-NURTURE DEBATE The argument about nature versus nurture, also referred to as heredity versus environment or *nativism* versus *empiricism*, is one of the oldest and most central theoretical issues within both psychology and philosophy. For example, have you ever heard someone say that "baby talk" will interfere with a child's language development? If so, then you have heard an argument for the nurture side of the debate. Such a statement assumes that language development is mostly a matter of imitation: The child must hear language that is properly pronounced and grammatically correct in order to develop linguistic fluency. The nature side would counter that children possess some kind of internal mechanism to ensure that they develop fluent language, no matter how many "goo-goo-ga-gas" they hear from those

around them. "Which side is right?" students invariably ask. If there were a simple answer to that question, the debate would have ceased long ago. Instead, the controversy continues today with regard to many developmental processes, including language development.

Philosophically, the nature side of the controversy was represented by the *idealists* and *rationalists*, principally Plato and René Descartes, both of whom believed that at least some knowledge is inborn. On the other side of the argument were a group of British philosophers called *empiricists*, including John Locke, who insisted that at birth the mind is a blank slate—in Latin, a *tabula rasa*. All knowledge, the empiricists argued, is created by experience. From this perspective, developmental change is the result of external, environmental factors acting on a child whose only relevant internal characteristic is the capacity to respond.

In contrast to both rationalists and empiricists, other philosophers believed that development involved an interaction between internal and external forces. For example, the Christian notion of *original sin* teaches that children are born with a selfish nature and must be spiritually reborn. After rebirth, children have access to the Holy Spirit, which helps them learn to behave morally through parental and church-based instruction in religious practice.

French philosopher Jean-Jacques Rousseau also believed in the idea of interaction between internal and external forces, but he claimed that all human beings are naturally good and seek out experiences that help them grow. For Rousseau, the goal of human development was to achieve one's inborn potential. "Good" developmental outcomes, such as a willingness to share one's possessions with others who are less fortunate, resulted from growing up in an environment that didn't interfere with the child's expression of his own innate characteristics. In contrast, "bad" outcomes, such as aggressive behavior, were learned from others or arose when a child experienced frustration in his efforts to follow the dictates of the innate goodness with which he was born.

The views of two of psychology's pioneers illustrate the way early psychologists approached the nature-nurture issue. G. Stanley Hall (1844–1924) believed that the milestones of childhood were dictated by an inborn developmental plan and were similar to those that had taken place in the evolution of the human species. He thought that developmentalists should identify **norms**, or average ages at which milestones happen. Norms, Hall said, could be used to learn about the evolution of the species as well as to track the development of individual children. So, for Hall, development was mostly about the nature side of the debate.

John Watson explained development in a way that was radically different from that of G. Stanley Hall. In fact, Watson coined a new term, behaviorism, to refer to his point of view (Watson, 1913). **Behaviorism** defines development in terms of behavior changes caused by environmental influences. Watson did not believe in an inborn developmental plan of any sort. Instead, he claimed that, through manipulation of the environment, children could be trained to be or do anything (Jones, 1924; Watson, 1930). As Watson put it,

> *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, merchant, chief, and yes, even beggarman and thief, regardless of his talents, penchants, abilities, vocations, and the race of his ancestors. (1930, p. 104)*

In a famous study known as the "Little Albert" experiment, Watson conditioned a baby to fear white rats (Watson & Rayner, 1920). As the baby played with the rat, Watson made banging sounds that frightened the child. Over time, the baby came to associate the rat with the noises. He cried and tried to escape from the room whenever the rat was present. Based on the Little Albert study and several others, Watson claimed that all age-related changes are the result of learning (Watson, 1928). Watch at MyDevelopmentLab

STAGES AND SEQUENCES The nature-nurture controversy is not the only "big question" in developmental psychology. An equally central dispute concerns the *continuity-discontinuity issue*: Is a child's expanding ability just "more of the same," or does it reflect a new kind of activity? For example, a 2-year-old is likely to have no individual friends among her playmates, while an 8-year-old is likely to have several. We could think of this as a *quantitative* change (a change in amount) from zero friends to some friends, which suggests that the qualitative aspects of friendship are the same at every age—or,

norms Average ages at which developmental events happen.

behaviorism The theoretical view that defines development in terms of behavior changes caused by environmental influences.

Watch the Video *Little Albert* at MyDevelopmentLab

John Watson's pioneering research on emotional learning in infants helped psychologists better understand the role of classical conditioning in child development.

© John Watson and infant

(left) © Pablo Paul/Alamy
(right) Quantum/Glowimages

Which photo represents continuous *or* quantitative *change? Which illustrates* discontinuous *or* qualitative *change?*

as developmentalists would express it, changes in friendships are *continuous* in nature. Alternatively, we could think of the difference in friendships from one age to another as a *qualitative* change (a change in kind or type)—from disinterest in peers to interest, or from one sort of peer relationship to another. In other words, in this view, changes in friendships are *discontinuous*, in that each change represents a change in the quality of a child's relationships with peers. Thus, friendships at 2 are quite different from friendships at 8 and differ in ways that cannot be captured by describing them solely in terms of the number of friends a child has.

Of particular significance is the idea that, if development consists only of additions (quantitative change), then the concept of stages is not needed to explain it. However, if development involves reorganization, or the emergence of wholly new strategies, qualities, or skills (qualitative change), then the concept of stages may be useful. Certainly, we hear a lot of "stagelike" language in everyday conversation about children: "He's just in the terrible twos" or "It's only a stage she's going through." Although there is not always agreement on just what would constitute evidence for the existence of discrete stages, the usual description is that a stage shift involves not only a change in skills but some discontinuous change in underlying structure (Lerner, Theokas, & Bobek, 2005). The child in a new stage approaches tasks differently, sees the world differently, is preoccupied with different issues.

Learning Objective 2
What are the internal and external variables that influence development?

Influences on Development

Most modern developmental psychologists agree that essentially every facet of a child's development is a product of some pattern of interaction of nature and nurture (Rutter, 2002). Further, most recognize that some aspects of development are continuous and others are more stagelike. Consequently, the discussions have become a bit more complex.

MATURATION Nature shapes development most clearly through genetic programming that may determine whole sequences of development. Developmentalist Arnold Gesell (1880–1961) used the term **maturation** to describe genetically programmed sequential patterns of change, and this term is still uniformly used today (Gesell, 1925; Thelen & Adolph, 1992). Any maturational pattern is marked by three qualities: It is universal, appearing in all children, across cultural and historical boundaries; it is sequential, involving some pattern of unfolding skill or characteristics; and it is resistant to environmental influence. In its purest form, a maturationally determined developmental sequence occurs regardless of practice or training. You don't have to practice growing pubic hair; you don't

maturation Sequential patterns of change that are governed by instructions contained in the genetic code and shared by all members of a species.

have to be taught how to walk. In fact, only extreme conditions, such as severe malnutrition, prevent such sequences from unfolding. Yet even confirmed maturational theorists agree that experience plays a role.

THE TIMING OF EXPERIENCE Research tells us that specific experience interacts with maturational patterns in intricate ways. For example, Greenough (1991) notes that one of the proteins required for the development of the visual system is controlled by a gene whose action is triggered only by visual experience. Moreover, experience is required to maintain the neural connections underlying vision (Briones, Klintsova, & Greenough, 2004). So some visual experience is needed for the genetic program to operate. The timing of specific experiences may matter as well. The impact of a particular visual experience may be quite different if it occurs at birth than if it occurs when a baby is older.

Developmentalists' thinking about the importance of timing was stimulated, in part, by research on other species that showed that specific experiences had different or stronger effects at some points in development than at others. The most famous example is that baby ducks will become imprinted on (become attached to and follow) any duck or any other quacking, moving object that happens to be around them 15 hours after they hatch. If nothing is moving or quacking at that critical point, they don't become imprinted at all (Hess, 1972). So the period just around 15 hours after hatching is a **critical period** for the duck's development of a proper following response.

In humans, we more often see *sensitive periods* than true critical periods. The difference is that a **sensitive period** is a time when a particular experience can be best incorporated into the maturational process, whereas a critical period is a time when an experience *must* happen or a particular developmental milestone will never occur. For example, infancy and early childhood are sensitive periods for language development. A child who is physically isolated from other humans by an abusive parent during these years will not develop normal language, but she will develop some language function once she is reintegrated into a normal social environment. **Watch** at **MyDevelopmentLab**

INBORN BIASES Another kind of internal influence is described by the concepts of *inborn biases*. For instance, researchers such as Elizabeth Spelke (1991) have concluded that babies come into the world with certain preexisting conceptions about the behavior of objects. Very young babies already seem to understand that unsupported objects will move downward and that a moving object will continue to move in the same direction unless it encounters an obstacle. Theorists do not propose that these built-in response patterns are the end of the story; rather, they see them as the starting point. Development is a result of experience filtered through these initial biases, but those biases constrain the number of developmental pathways that are possible (Cole & Packer, 2011).

BEHAVIOR GENETICS The concept of maturation and the idea of inborn biases are both designed to account for patterns and sequences of development that are the same for all children. At the same time, nature contributes to variations from one individual to the next. The study of genetic contributions to individual behavior, called **behavior genetics**, uses two primary research techniques—the study of identical and fraternal twins and the study of adopted children. If identical twins are more like each other on some dimension than other kinds of siblings are, despite having grown up in different environments, this is rather compelling evidence of a genetic contribution for that trait. In the case of adopted children, the strategy is to compare the degree of similarity between the adopted child and his birth parents (with whom he shares genes but not environment) with the degree of similarity between the adopted child and his adoptive parents (with whom he shares environment but not genes). If the child turns out to be more similar to his birth parents than to his adoptive parents, or if his behavior or skills are better predicted by the characteristics of his birth parents than by characteristics of his adoptive parents, that evidence would again demonstrate the influence of heredity. Behavior geneticists have shown that heredity affects a remarkably broad range of behaviors (Netherlands Twin Register, 2010). These include intellectual as well as social and emotional functioning. Consequently, you will be reading about the results of twin and adoption studies in several future chapters.

critical period Any time period during development when an organism is especially responsive to and learns from a specific type of stimulation. The same stimulation at other points in development has little or no effect.

sensitive period A period during which particular experiences can best contribute to proper development. It is similar to a critical period, but the effects of deprivation during a sensitive period are not as severe as during a critical period.

behavior genetics The study of the genetic contributions to behavior or traits such as intelligence or personality.

Watch the **Video** *Windows of Opportunity for Childhood Development* at **MyDevelopmentLab**

The study of identical twins, like these two girls, is one of the classic methods of behavior genetics. Whenever pairs of identical twins are more like each other in some behavior or quality than are pairs of fraternal twins, a genetic influence is likely at work.

GENE-ENVIRONMENT INTERACTION A child's genetic heritage may also affect his environment (Caspi & Moffitt, 2006), a phenomenon that could occur via two routes. First, the child inherits his genes from his parents, who also create the environment in which he is growing up. So a child's genetic heritage may predict something about his environment. For example, parents who themselves have higher IQ scores are not only likely to pass their "good IQ" genes on to their children, but also likely to create a richer, more stimulating environment for those children. Similarly, children who inherit a tendency toward aggression or hostility from their parents are likely to live in a family environment that is higher in criticism and negativity—because those are expressions of the parents' own genetic tendencies toward aggressiveness or hostility (Reiss, 1998).

Second, each child's unique pattern of inherited qualities affects the way she behaves with other people, which in turn affects the way adults and other children respond to her. A cranky or temperamentally difficult baby may receive fewer smiles and more scolding than a placid, even-tempered one; a genetically brighter child may demand more personal attention, ask more questions, or seek out more complex toys than would a less bright child (Saudino & Plomin, 1997). Furthermore, children's interpretations of their experiences are affected by all their inherited tendencies (Plomin, Reiss, Hetherington, & Howe, 1994).

INTERNAL MODELS OF EXPERIENCE Although we often associate experience exclusively with external forces, it's just as important to consider each individual's view of his or her experiences—in other words, the internal aspect of experience. For instance, suppose a friend says to you, "Your new haircut looks great. I think it's a lot more becoming when it's short like that." Your friend intends it as a compliment, but what determines your reaction is how you hear the comment, not what is intended. If your internal model of your self includes the basic idea "I usually look okay," you will likely hear your friend's comment as a compliment; but if your internal model of self or relationships includes some more negative elements, such as "I usually do things wrong, so other people criticize me," then you may hear an implied criticism in your friend's comment ("Your hair used to look awful").

Theorists who emphasize the importance of such meaning systems argue that each child creates a set of **internal models of experience**—a set of core ideas or assumptions about the world, about himself, and about relationships with others—through which all subsequent experience is filtered (Epstein, 1991; Reiss, 1998). Such assumptions are certainly based in part on actual experiences, but once they are formed into an internal model, they generalize beyond the original experience and affect the way the child interprets future experiences. A child who expects adults to be reliable and affectionate will be more likely to interpret the behavior of new adults in this way and will create friendly and affectionate relationships with others outside of the family. A child's self-concept seems to operate in much the same way, as an internal working model of "who I am" (Bretherton, 1991). This self-model is based on experience, but it also shapes future experience.

internal models of experience
A theoretical concept emphasizing that each child creates a set of core ideas or assumptions about the world, the self, and relationships with others through which all subsequent experience is filtered.

ASLIN'S MODEL OF ENVIRONMENTAL INFLUENCE Theoretical models are useful for organizing ideas about how all these factors interact to influence development. One particularly good example of a theoretical approach that attempts to explain environmental influences is a set of models summarized by Richard Aslin (1981), based on earlier work by Gottlieb (1976a, 1976b) and shown schematically in Figure 1. Aslin and his colleagues have used these models to study infants' perception of speech and objects (e.g., Aslin, 2011; Maye, Weiss, & Aslin, 2008). In each drawing the dashed line represents the path of development of some skill or behavior that would occur without a particular experience; the solid line represents the path of development if the experience were added.

For comparison purposes, the first of the five models shows a maturational pattern with no environmental effect. The second model, which Aslin calls *maintenance*, describes a pattern in which some environmental input is necessary to sustain a skill or behavior that has already developed maturationally. For example, kittens are born with full binocular vision, but if you

cover one of their eyes for a period of time, their binocular skill declines.

The third model shows a *facilitation* effect of the environment, in which a skill or behavior develops earlier than it normally would because of some experience. For example, children whose parents talk to them more often in the first 18 to 24 months of life, using more complex sentences, appear to develop two-word sentences and other early grammatical forms somewhat earlier than do children who are talked to less. Yet less-talked-to children do eventually learn to create complex sentences and use most grammatical forms correctly, so the experience of being talked to more provides no permanent gain.

When a particular experience does lead to a permanent gain, or an enduringly higher level of performance, Aslin calls the model *attunement*. For example, children from poverty-level families who attend special enriched child care in infancy and early childhood have consistently higher IQ scores throughout childhood than do children from the same kinds of families who do not have such enriched experience (Ramey & Ramey, 2004). Aslin's final model, *induction*, describes a pure environmental effect: In the absence of some experience, a particular behavior does not develop at all. Giving a child tennis lessons or exposing him to a second language falls into this category of experience.

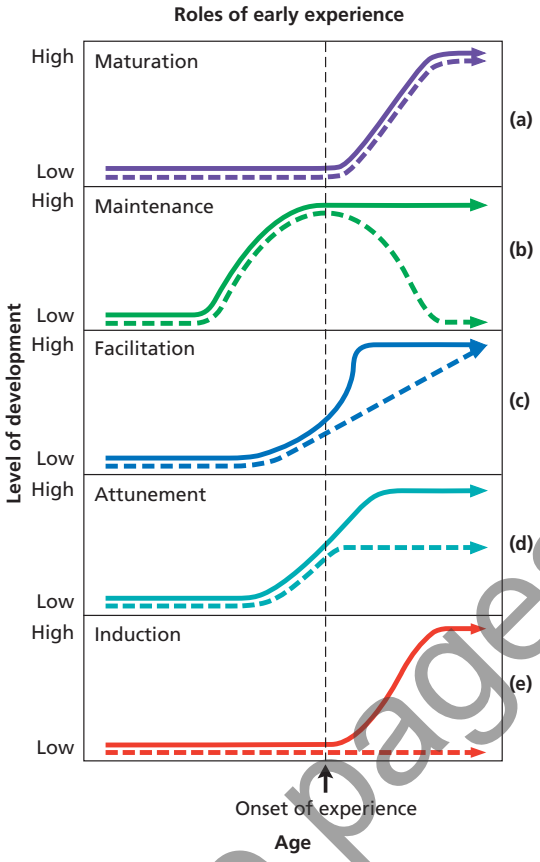

FIGURE 1 Aslin's Models of Environmental Influence
Aslin proposed five models of possible relationships between maturation and environment. The top model shows a purely maturational effect; the bottom model (induction) shows a purely environmental effect. The other three show interactive combinations: maintenance, in which experience prevents the deterioration of a maturationally developed skill; facilitation, in which experience speeds up the development of some maturational process; and attunement, in which experience increases the ultimate level of some skill or behavior above the "normal" maturational level.

(*Source:* Aslin, Richard N. "Experiential Influences and Sensitive Periods in Perceptual Development," *Development of perception. Psychobiological perspectives: Vol. 2. The visual system* (1981), p. 50. Reprinted by permission of Elsevier Science and the author.)

The Ecological Perspective and the Cultural Context of Development

Learning Objective 3
How does the ecological perspective improve scientists' understanding of child development?

Until quite recently, most research on environmental influences focused on a child's family (frequently only the child's mother) and on the stimulation available in the child's home, such as the kinds of toys or books available to the child. If psychologists looked at a larger family context at all, it was usually only in terms of the family's economic status—its level of wealth or poverty. Since the early 1980s, however, there has been a strong push to widen the scope of research, to consider the *ecology*, or *context*, in which each child develops. The late Urie Bronfenbrenner (1917–2005), one of the key figures in this area of study (1979, 1989), emphasizes that each child grows up in a complex social environment (a social ecology) with a distinct cast of characters: siblings, parents, grandparents, baby-sitters, pets, teachers, friends. And this cast is itself embedded within a larger social system: The parents have jobs that they may like or dislike; they may or may not have close and supportive friends; they may be living in a safe neighborhood or one full of dangers; the local school may be excellent or poor; and the parents may have good or poor relationships with the school. Bronfenbrenner's argument is that researchers not only must include descriptions of these more extended aspects of the environment but must also consider the ways in which all the components of this complex system interact with one another to affect the development of an individual child.

One aspect of such a larger ecology is the still broader concept of *culture*, a system of meanings and customs, including values, attitudes, goals, laws, beliefs, morals, and physical artifacts of

various kinds, such as tools and forms of dwellings. For a system of meanings and customs to be called a culture, it must be shared by some identifiable group, whether that group is the entire population of a country or a subsection of such a population; it must then be transmitted from one generation of that group to the next (Cole & Packer, 2011). Families and children are clearly embedded in culture, just as they are located within an ecological niche within the culture. The majority U.S. culture, for example, is strongly shaped by the values expressed in the Constitution and the Bill of Rights; it also includes a strong emphasis on "can-do" attitudes and on competition.

Anthropologists point out that a key dimension on which cultures differ from one another is that of *individualism* versus *collectivism* (e.g., Kashima et al., 2005). People in cultures with an individualistic emphasis assume that the world is made up of independent persons whose achievement and responsibility are individual rather than collective. Most European cultures are based on such individualistic assumptions, as is the dominant U.S. culture, created primarily by Whites who came to the United States from Europe. In contrast, most of the remainder of the world's cultures operate with a collectivist belief system in which the emphasis is on collective rather than individual identity, on group solidarity, sharing, duties and obligations, and group decision making (Kashima et al., 2005). A person living in a collectivist system is integrated into a strong, cohesive group that protects and nourishes that individual throughout his life. Collectivism is the dominant theme in most Asian countries, as well as in many African and South American cultures. Strong elements of collectivism are also part of the African American, Hispanic American, Native American, and Asian American subcultures.

Greenfield (1995) gives a wonderful example of how the difference between collectivist and individualist cultures can affect actual child-rearing practices as well as people's judgments of others' child-rearing. She notes that mothers from the Zinacanteco Maya culture maintain almost constant bodily contact with their young babies and do not feel comfortable when they are separated from their infants. They believe that their babies require this contact to be happy. When these mothers saw a visiting American anthropologist put her own baby down, they were shocked and blamed the baby's regular crying on the fact that he was separated from his mother so often. Greenfield argues that the constant bodily contact of the Mayan mothers is a logical outgrowth of their collectivist approach, because their basic goal is interdependence rather than independence. The American anthropologist, in contrast, operates with a basic goal of independence for her child and so emphasizes more separation. Each group judges the other's form of child-rearing to be less optimal or even inadequate.

Such differences notwithstanding, researchers note that it is wrong to think of collectivism and individualism in either-or terms, because there are elements of both in every culture (Green, Deschamps, & Páez, 2005). Consequently, when researchers categorize a given culture as collectivist or individualist, they are referring to which of the two sets of values predominates. It is also true that there is a considerable amount of individual variation within cultures. Thus, people who live in individualistic societies may nevertheless, as individuals, develop a collectivist orientation. The same is true for their counterparts in collectivist societies.

Learning Objective 4

In what ways do the concepts of vulnerability and resilience help us better understand child development?

Vulnerability and Resilience

At this point, it should be clear to you the same environment may have quite different effects on children who are born with different characteristics. One influential research approach exploring such an interaction is long-term study of a group of children born in 1955 on the island of Kauai, Hawaii by Emmy Werner and Ruth Smith (Werner, 1993, 1995; Werner & Smith, 1992, 2001). Werner and Smith found that only about two-thirds of the children who grew up in poverty-level, chaotic families turned out to have serious problems themselves as adults. The other third, described as *resilient*, turned out to be "competent, confident, and caring adults" (Werner, 1995, p. 82). Thus, similar environments were linked to quite different outcomes.

Many theorists argue that the best way to make sense out of results like Werner and Smith's is to think of each child as born with certain *vulnerabilities*, such as a difficult temperament, a physical abnormality, allergies, or a genetic tendency toward alcoholism (Garmezy, 1993; Howard, Carothers, Smith, & Akai, 2007; Rutter, 1987, 2005b). Each child is also born with some *protective factors*, such as high intelligence, good coordination, an easy temperament, or a lovely smile, which tend to make her more resilient in the face of stress. These vulnerabilities and

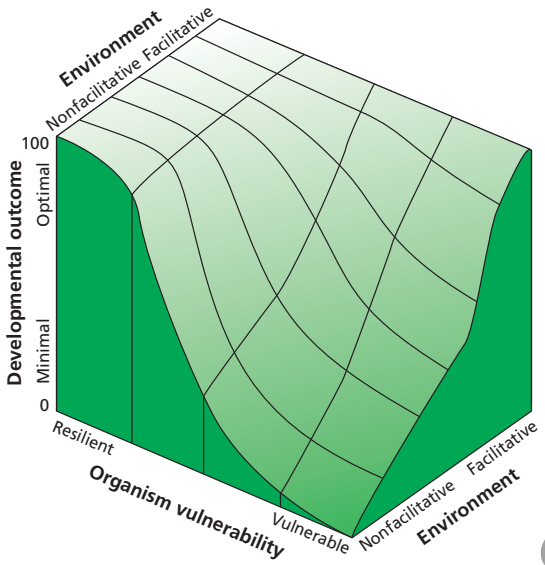

FIGURE 2 Horowitz's Model of Vulnerability and Resilience
Horowitz's model describes one possible type of interaction between the vulnerability of the child and the quality of the environment. The height of the surface shows the "goodness" of the developmental outcome (such as IQ or skill in social relationships). In this model, only the combination of a vulnerable infant and a nonfacilitative environment will result in a really poor outcome.

(*Source: Exploring Developmental Theories: Toward a Structural/Behavioral Model of Development*, by Horowitz, F. D. Copyright 1987 by Taylor & Francis Group LLC-Books. Reproduced with permission of Taylor & Francis Group LLC.)

protective factors then interact with the child's environment, and thus the same environment can have quite different effects, depending on the qualities the child brings to the interaction.

A more general model describing the interaction between the qualities of the child and the environment comes from Fran Horowitz (1987, 2003), who proposes that the key ingredients are each child's vulnerability or resilience and the "facilitativeness" of the environment. A highly facilitative environment is one in which the child has loving and responsive parents and is provided with a rich array of stimulation. If the relationship between vulnerability and facilitativeness were merely additive, the best outcomes would occur for resilient infants reared in optimal environments, and the worst outcomes for vulnerable infants in poor environments, with the two mixed combinations falling halfway between. But that is not what Horowitz proposes, as you can see represented schematically in Figure 2 above. Instead, she is suggesting that a resilient child in a poor environment may do quite well, since such a child can take advantage of all the stimulation and opportunities available. Similarly, she suggests that a vulnerable child may do quite well in a highly facilitative environment. According to this model, it is only the "double whammy"—the vulnerable child in a poor environment—that leads to really poor outcomes.

In fact, a growing body of research shows precisely this pattern. For example, very low IQ scores are most common among children who were low-birth-weight babies and were reared in poverty-level families, while low-birth-weight children reared in middle-class families have essentially average IQs, as do normal-weight infants reared in poverty-level families (Werner, 1986). Further, among low-birth-weight children who are reared in poverty-level families, those whose families offer "protective" factors (such as greater residential stability, less crowded living conditions, and more acceptance, more stimulation, and more learning materials) achieve higher IQ scores than do equivalently low-birth-weight children reared in the least optimal poverty-level conditions (Bradley et al., 1994). The key point here is that the same environment can have quite different effects, depending on the qualities or capacities the child brings to the equation.

Many children who grow up in poverty-stricken neighborhoods are high achievers who are well adjusted. Developmentalists use the term resilient to *refer to children who demonstrate positive developmental outcomes despite being raised in high-risk environments.*
© Getty Images

Three Kinds of Change

Learning Objective 5
How do the three kinds of age-related change differ?

Age-related changes are a part of our everyday lives, so much so that we often give them little thought. Yet, consider the difference between a human being's first step and his or her first date. Clearly, both are related to age, but they represent fundamentally different kinds of change. Generally, developmental scientists think of each age- related change as falling into one of three categories.

(left) © National Geographic Image Collection/Alamy Limited
(right) © auremar/Shutterstock

Walking and puberty are normative age-graded changes; they happen to every individual within fairly narrow age ranges. The precise ages within these ranges when these milestones occur in an individual's life are individual differences.

Normative age-graded changes are universal; that is, they are common to every individual in a species and are linked to specific ages. Some universal changes, like a baby's first steps, happen because we are all biological organisms subject to a genetically programmed maturation process. The infant who shifts from crawling to walking and the older adult whose skin becomes progressively more wrinkled are both following a plan that is an intrinsic part of the physical body, most likely something in the genetic code itself. However, some changes are universal because of shared experiences. In each culture, the *social clock*, or a set of age norms, defines a sequence of normal life experiences, such as the common practice of beginning children's formal education sometime between the ages of 5 and 7.

Equally important as a source of variation in life experience are historical forces, which affect each generation somewhat differently. Such changes are called **normative history-graded changes**. Social scientists use the word **cohort** to describe a group of individuals who are born within some fairly narrow span of years and thus share the same historical experiences at the same times in their lives. For instance, ask anyone what distinguishes children who are growing up in the twenty-first century from their counterparts in earlier eras, and the word "technology" is likely to be included in the answer. Consequently, developmental scientists are interested in studying the impact of today's high-tech world on the development of children and adolescents (see *Technology and the Developing Child*).

Finally, **nonnormative changes**, or **individual differences**, result from unique, unshared events. One clearly unshared event in each person's life is conception; the combination of genes each individual receives at conception is unique. Thus, genetic differences—including physical characteristics such as body type and hair color as well as genetic disorders—represent one category of individual differences. Characteristics influenced by both heredity and environment, such as intelligence and personality, constitute another class of individual differences. Other individual differences are the result of the timing of a developmental event.

normative age-graded changes
Changes that are common to every member of a species.

normative history-graded changes
Changes that occur in most members of a cohort as a result of factors at work during a specific, well-defined historical period.

cohort A group of individuals who share the same historical experiences at the same times in their lives.

nonnormative changes (individual differences) Changes that result from unique, unshared events.

TECHNOLOGY AND THE DEVELOPING CHILD

Cohort Effects of Health Information on the Internet

Surveys show that more than 90% of parents search the Internet for information on children's health topics (Moseley, Freed, & Goold, 2011). Consequently, pediatricians have expressed concern about the prevalence of inaccurate health information online (Scullard, Peacock, & Davies, 2010). In response, the American Academy of Pediatrics (AAP) developed a website to which pediatricians can direct parents (http://www.healthychildren.org) who are looking for reliable information on children's health topics.

Studies suggest that parents appreciate receiving such "information prescriptions" from their pediatricians (D'Alessandro, Kreiter, Kinzer, & Peterson, 2004). Moreover, research shows that children of parents who are knowledgeable about health tend to show better health outcomes than those of parents who are less knowledgeable (DeWalt & Hink, 2009). Thus, the efforts of professional organizations such as the AAP to provide parents with reliable sources of health knowledge may cause today's cohort of children to be healthier than their counterparts in previous eras.

Learning Objective 5a
How is the availability of health information on the Internet likely to affect today's cohort of parents and children?

Find Out More

Use your Internet search skills to answer these questions.

1. Take a look at www.healthychildren.org. Use the website's search tool to find information on a parenting topic, such as breastfeeding or punishment. What suggestions do you have for making the website more helpful?
2. Do a Google search on a disease, such as asthma or measles. You will find that many medicals journals nowadays publish research articles online. What are the pros and cons of making such information available to non-scientists via the Internet?

Theories of Development

Developmental theories are sets of statements that propose general principles of development. Students often say that they dislike reading about theories; what they want are the facts. However, theories are important, because they help us look at facts from different perspectives. A brief introduction to several important theories will help you understand some of the more detailed information about them presented in later chapters. Watch at MyDevelopmentLab

Watch the Video *Different Approaches to Psychology* at MyDevelopmentLab

Psychoanalytic Theories

Learning Objective 6
What are the main ideas of the psychoanalytic theories?

The most distinctive and central assumption of the **psychoanalytic theories** is that behavior is governed by unconscious as well as conscious processes. Psychoanalytic theorists also see development as fundamentally stage-like, with each stage centered on a particular form of tension or a particular task. The child moves through these stages, resolving each task or reducing each tension as best he can. This emphasis on the formative role of early experience is a hallmark of psychoanalytic theories. In this view, the first 5 or 6 years of life constitute a kind of sensitive period for the creation of the individual personality. Sigmund Freud (1856–1939) is usually credited with originating the psychoanalytic approach (1905, 1920), and his terminology and many of his concepts have become part of our intellectual culture. Another theorist in this tradition, Erik Erikson (1902–1994), has also had a large impact on the way psychologists think about personality development.

When parents divorce, boys are more likely to show disturbed behavior or poorer school performance than are girls. But why? Theories can help to explain facts like this.

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FREUD'S THEORY Freud proposed the existence of a basic, unconscious, instinctual sexual drive he called the **libido**. He argued that this energy is the motive force behind virtually all human behavior. Freud also proposed that unconscious material is created over time through the functioning of the various *defense mechanisms*, several of which are listed in Table 1. We all use defense mechanisms every day, and Freud's ideas about them continue to be influential among psychologists (Cramer, 2000).

developmental theories Sets of statements that propose general principles of development.

psychoanalytic theories Developmental theories based on the assumption that age-related change results from maturationally determined conflicts between internal drives and society's demands.

libido The term used by Freud to describe the basic, unconscious, instinctual sexual energy in each individual.

Table 1

SOME COMMON DEFENSE MECHANISMS

Mechanism	Definition	Example
Denial	Behaving as if a problem doesn't exist	A pregnant woman fails to get prenatal care because she convinces herself she can't possibly be pregnant even though she has all the symptoms.
Repression	Intentionally forgetting something unpleasant	A child "forgets" about a troublesome bully on the bus as soon as he gets safely home from school every day.
Projection	Seeing one's own behavior or beliefs in others whether they are actually present or not	A woman complains about her boss to a co-worker and comes away from the conversation believing that the co-worker shares her dislike of the boss, even though the co-worker made no comment on what she said.
Regression	Behaving in a way that is inappropriate for one's age	A toilet-trained 2-year-old starts wetting the bed every night after a new baby arrives.
Displacement	Directing emotion to an object or person other than the one provoking it	An elderly adult suffers a stroke, becomes physically impaired, and expresses her frustration through verbal abuse of the hospital staff.
Rationalization	Creating an explanation to justify an action or to deal with a disappointment	A man stealing money from his employer says to himself, "They won't give me a raise. So what if I took $50?"

A second basic assumption is that personality has a structure, which develops over time. Freud proposed three parts of the personality: the **id**, which is the source of the libido; the **ego**, a much more conscious element, the "executive" of the personality; and the **superego**, which is the center of conscience and morality, since it incorporates the norms and moral strictures of the family and society. In Freud's theory, these three parts are not all present at birth. The infant and toddler is all id—all instinct, all desire, without the restraining influence of the ego or the superego. The ego begins to develop in the years from age 2 to about 4 or 5, as the child learns to adapt her instant-gratification strategies. Finally, the superego begins to develop just before school age, as the child incorporates the parents' values and cultural mores.

Explore the Concept *Freud's Five Psychosexual Stages of Personality Development* at MyDevelopmentLab

id In Freudian theory, the inborn, primitive portion of the personality, the storehouse of libido, the basic energy that continually pushes for immediate gratification.

ego In Freudian theory, the portion of the personality that organizes, plans, and keeps the person in touch with reality. Language and thought are both ego functions.

superego In Freudian theory, the "conscience" part of personality, which contains parental and societal values and attitudes incorporated during childhood.

psychosexual stages The stages of personality development suggested by Freud: the oral, anal, phallic, latency, and genital stages.

psychosocial stages The stages of personality development suggested by Erikson, involving basic trust, autonomy, initiative, industry, identity, intimacy, generativity, and ego integrity.

Freud thought the stages of personality development were strongly influenced by maturation. In each of Freud's five **psychosexual stages**, the libido is centered in that part of the body that is most sensitive at that age. In a newborn, the mouth is the most sensitive part of the body, so libidinal energy is focused there. The stage is therefore called the *oral stage*. As neurological development progresses, the infant has more sensation in the anus (hence the *anal stage*) and later in the genitalia (the *phallic* and eventually the *genital stages*). Explore at MyDevelopmentLab

ERIKSON'S THEORY The stages Erikson proposed, called **psychosocial stages**, are influenced by common cultural demands for children of a particular age, such as the demand that a child become toilet trained at about age 2. In Erikson's view, each child moves through a fixed sequence of tasks, each centered on the development of a particular facet of identity. For example, the first task, central to the first 12 to 18 months of life, is to develop a sense of *basic trust*. If the child's caregivers are not responsive and loving, however, the child may develop a sense of basic mistrust, which will affect his responses at all the later stages.

In both Freud's and Erikson's theories, the critical point is that the degree of success a child experiences in meeting the demands of these various stages will depend very heavily on the interactions he has with the people and objects in his world. This interactive element in Freud's and all subsequent psychoanalytic theories is absolutely central. Basic trust cannot be developed unless the parents or other caregivers respond to the infant in a loving, consistent manner. The oral stage cannot be fully completed unless the infant's desire for oral stimulation is sufficiently gratified. And when a stage is not fully resolved, the old

pattern or the unmet need is carried forward, affecting the individual's ability to handle later tasks or stages. So, for example, a young adult who developed a sense of mistrust in the first years of life may have a more difficult time establishing a secure intimate relationship with a partner or with friends. Explore at MyDevelopmentLab

Explore the Concept *Erikson's First Four Stages of Psychosocial Development* at MyDevelopmentLab

Cognitive Theories

Learning Objective 7
What are the main ideas of cognitive-developmental and information-processing theories?

In psychoanalytic theories, the quality and character of a child's relationships with a few key people are seen as central to the child's whole development. **Cognitive-developmental theories**, which emphasize primarily cognitive development rather than personality, reverse this order of importance, emphasizing the centrality of the child's actions on the environment and her cognitive processing of experiences.

PIAGET'S THEORY The central figure in cognitive-developmental theory has been Jean Piaget (1896–1980), a Swiss psychologist whose theories (1952, 1970, 1977; Piaget & Inhelder, 1969) shaped the thinking of several generations of developmental psychologists. Piaget was struck by the great regularities in the development of children's thinking. He noticed that all children seem to go through the same kinds of sequential discoveries about their world, making the same sorts of mistakes and arriving at the same solutions. For example, all 3- and 4-year-olds seem to think that if you pour water from a short, fat glass into a tall, thin one, there is more water in the thin glass, since the water level is higher there than in the fat glass. In contrast, most 7-year-olds realize that the amount of water is the same in either glass.

Piaget's detailed observations of such systematic shifts in children's thinking led him to several assumptions, the most central of which is that it is the nature of the human organism to adapt to its environment. This is an active process. In contrast to many theorists, Piaget did not think that the environment shapes the child. Rather, the child (like the adult) actively seeks to understand his environment. In the process, he explores, manipulates, and examines the objects and people in his world.

The process of adaptation, in Piaget's view, is made up of several important subprocesses—*assimilation*, *accommodation*, and *equilibration*. What is important to understand at this preliminary point is that Piaget thought that the child develops a series of fairly distinct "understandings," or "theories," about the way the world works, based on her active exploration of the environment. Each of these "theories" corresponds to a specific stage. Piaget thought that virtually all infants begin with the same skills and built-in strategies and since the environments children encounter are highly similar in important respects, he believed that the stages through which children's thinking moves are also similar. Piaget proposed a fixed sequence of four major stages, each growing out of the one that preceded it, and each consisting of a more or less complete system or organization of concepts, strategies, and assumptions.

VYGOTSKY'S THEORY Like Piaget, Russian psychologist Lev Vygotsky (1896–1934) was primarily concerned with understanding the origins of the child's knowledge (1978\1930). Vygotsky differed from Piaget, however, in one key respect: He was convinced that complex forms of thinking have their origins in social interactions (Duncan, 1995). According to Vygotsky, a child's learning of new cognitive skills is guided by an adult (or a more skilled child, such as an older sibling), who models and structures the child's learning experience, a process Jerome Bruner later called **scaffolding** (Wood, Bruner, & Ross, 1976). Such new learning, Vygotsky suggested, is best achieved in what he called the **zone of proximal development**—that range of tasks which are too hard for the child to do alone but which she can manage with guidance. As the child becomes more skilled, the zone of proximal development steadily widens, including ever harder tasks. Vygotsky thought the key to this interactive process lay in the language the adult used to describe or frame the task. Later, the child could use this same language to guide her independent attempts to do the same kinds of tasks. Watch at MyDevelopmentLab

cognitive-developmental theories Developmental theories that emphasize children's actions on the environment and suggest that age-related changes in reasoning precede and explain changes in other domains.

scaffolding The term used by Bruner to describe the process by which a teacher (or parent, older child, or other person in the role of teacher) structures a learning encounter with a child, so as to lead the child from step to step—a process consistent with Vygotsky's theory of cognitive development.

zone of proximal development In Vygotsky's theory, the range of tasks that are slightly too difficult for a child to do alone but that can be accomplished successfully with guidance from an adult or more experienced child.

Watch the Video *Zone of Proximal Development* at MyDevelopmentLab

Piaget based many of his ideas on naturalistic observation of children of different ages on playgrounds and in schools.

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information-processing theories A set of theories based on the idea that humans process information in ways that are similar to those used in computers.

Watch the Video *The Penny Test* at MyDevelopmentLab

INFORMATION-PROCESSING THEORY Although it is not truly a cognitive-developmental theory, many of the ideas and research studies associated with **information-processing theory** have increased psychologists' understanding of Piaget's stages and other age-related changes in thinking. The goal of information-processing theory is to explain how the mind manages information (Munakata, 2006). Information-processing theorists use the computer as a model of human thinking. Consequently, they often use computer terms such as *hardware* and *software* to talk about human cognitive processes. Watch at MyDevelopmentLab

Theorizing about and studying memory processes are central to information-processing theory (Birney, Citron-Pousty, Lutz, & Sternberg, 2005). Theorists usually break memory down into subprocesses of encoding, storage, and retrieval. *Encoding* is organizing information to be stored in memory. For example, you may be encoding the information in this chapter by relating it to your own childhood. *Storage* is keeping information, and *retrieval* is getting information out of memory.

Most memory research assumes that the memory system is made up of multiple components. The idea is that information moves through these components in an organized way (see Figure 3). The process of understanding a spoken word serves as a good example. First, you hear the word when the sounds enter your *sensory memory*. Your experiences with language allow you to recognize the pattern of sounds as a word. Next, the word moves into your *short-term memory*, the component of the memory system where all information is processed. Thus, short-term memory is often called *working memory*. Knowledge of the word's meaning is then called up out of *long-term memory*, the component of the system where information is permanently stored, and placed in short-term memory, where it is linked to the word's sounds to enable you to understand what you have just heard.

Each memory component manages information differently. Information flows through sensory memory as if in a stream. Bits of information that are not attended to drop out quickly. Short-term memory is extremely limited in capacity—an adult's short-term memory can hold about seven items at a time. However, information can be retained in short-term memory as long as it is processed in some way—for example, when you repeat your grocery list to yourself on the way to the store.

Long-term memory is unlimited in capacity, and information is often stored in terms of meaningful associations. For example, suppose you read a sentence such as "Bill wrote a letter to his brother." When you think about the sentence later, you might mistakenly recall that it contained the word *pen*. This happens because information about the process of writing and the tools used to do it are stored together in long-term memory.

There are both age-related and individual differences in information processing. The number of items that can be retained in short-term memory at one time is far more limited in young children than in adults and older children. In addition, among children of the same age, some use more efficient strategies for remembering and solving problems. Looking at differences of both kinds and examining children's thinking from Piaget's and Vygotsky's perspectives provide a more complete picture of how children acquire the ability to reason logically.

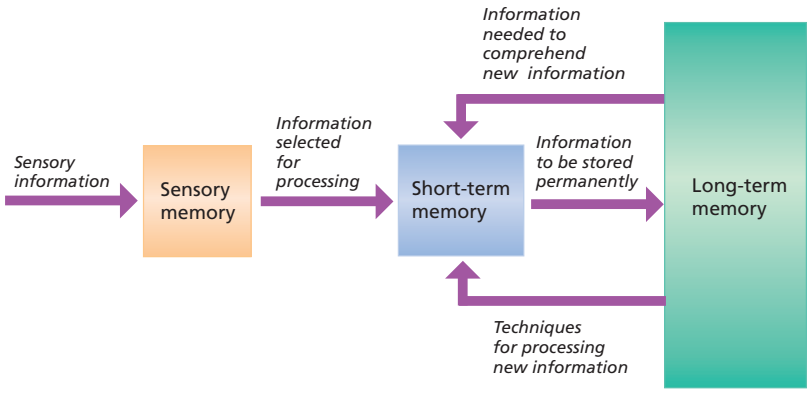

FIGURE 3 The Information-Processing System
Information-processing research on memory is based on the assumption that information moves into, out of, and through sensory, short-term, and long-term memories in an organized way.