Key Question Chapter Outline

CORE CONCEPTS

Psychology in Your Life

How Do Psychologists Explain Development?

- The Nature–Nurture Interaction
- Gradual versus Abrupt Change

Development is a process of growth, change, and consistency brought about by an interaction of heredity and environment.

Psychological Traits in Your Genes

While genes contribute to your thoughts and behaviors, you shouldn't assume that biology is everything.

What Capabilities Does the Child Possess?

- Prenatal Development
- The Neonatal Period: Abilities of the Newborn Child
- Infancy and Childhood: Building on the Neonatal Blueprint

Newborns have innate abilities for finding nourishment, interacting with others, and avoiding harmful situations, while the developing abilities of infants and children rely more on learning.

Does Your Child Measure Up?

The developmental milestones are averages, but children show great variation in their development.

What Are the Developmental Tasks of Infancy and Childhood?

- Cognitive Development: Piaget's Theory
- Social and Emotional Development

Infants and children face especially important developmental tasks in the areas of cognition and social relationships—tasks that lay a foundation for further growth in adolescence and adulthood.

Childhood Influences on Your Personality

Erikson's theory says that your personality is shaped by a series of developmental crises.

What Changes Mark the Transition of Adolescence?

- Adolescence and Culture
- Physical Maturation in Adolescence
- Cognitive Development in Adolescence
- Social and Emotional Issues in Adolescence
- Sexual Issues in Adolescence

Adolescence offers new developmental challenges growing out of physical changes, cognitive changes, and socioemotional pressures.

The Development of Moral Thinking

Moral dilemmas reveal stages of moral reasoning—but not necessarily moral behavior.

What Developmental Challenges Do Adults Face?

- Erikson's Theory of Young Adulthood: Intimacy versus Isolation
- The Challenge of Midlife: Generativity versus Stagnation
- New Perspectives on Women, Men, Work, and Family

Nature and nurture continue to produce changes throughout life, but in adulthood these changes include both growth and decline.

The Last Developmental Challenges You Will Face

The final years of life present a challenge, but a new picture of aging is emerging.

Developmental Psychology: The State of the Art

USING PSYCHOLOGY TO LEARN PSYCHOLOGY:
Cognitive Development in College

Chapter

9

Psychological Development

WHAT COULD GRAB PUBLIC interest more effectively than a story of twins separated at birth and reunited as adults? Many such tales have come out of the twin-study project at the University of Minnesota. But what really attracts journalists are the reports of uncanny similarities between identical twins who were raised by different parents, taught by different teachers, influenced by different peers and siblings, and sometimes even raised in different cultures.

Take, for example, the "Jim Twins." Separated just a few weeks after they were born, identical twins Jim Springer and Jim Lewis were adopted separately and raised apart. Yet something drove them on parallel paths, even though those paths didn't cross again for 39 years. At their reunion, the "Jim twins" discovered some remarkable correspondences in their habits, preferences, and experiences. Some examples:

- They achieved nearly identical scores on tests of personality, intelligence, attitudes, and interests.
- Medically, both have mildly high blood pressure and have had spells that they mistakenly thought were heart attacks; both have had vasectomies; both suffer from migraine headaches.
- Both chain-smoke Salem cigarettes and drink Miller Lite beer.

- Both had been indifferent students: Jim Lewis had dropped out in the 10th grade, while Jim Springer had managed to graduate from high school.
- Both had been married twice, and both of their first wives were named Linda. Both of their second wives were named Betty. Both men like to leave love notes around the house.
- Lewis had three sons, including one named James Alan. Springer had three daughters, plus a son named James Allan.
- Both had owned dogs named Toy.
- Both drive Chevrolets, chew their fingernails, like stock-car racing, and dislike baseball.
- Both had been sheriff's deputies.
- Both do woodworking as a hobby. Lewis likes to make miniature picnic tables, and Springer makes miniature rocking chairs. Both had built white benches around trees in their yards.

When he first read about the two Jims in a newspaper, psychologist Thomas Bouchard knew their case presented a rare opportunity to study the relative effects of heredity and environment and how they unfold over time in the process we call *development* (Holden, 1980a, b; Jackson, 1980; Lykken et al., 1992). The Jims agreed to participate and so became the first of some 115 pairs of reunited twins (plus four sets of reared-apart triplets) to be studied over the next 20 years at the University of Minnesota.

Another remarkable pair, Oskar Stör and Jack Yufe, were also separated at birth, and from that point on their lives went in almost unbelievably different directions. Stör was raised by his grandmother in Czechoslovakia and attended a Nazi-run school during World War II, while Yufe was taken to Trinidad, where he was raised as a Jew by his biological father. Oskar is now married, a strong union man, and a devoted skier, while Jack is separated, a businessman, and a self-styled workaholic. Still, alongside these huge differences, the researchers again found some striking similarities in seemingly trivial behavior patterns. Both twins wear neatly clipped moustaches; both read magazines from back to front; both have a habit of storing rubber bands on their wrists; both flush the toilet before using it; both like to dunk buttered toast in coffee; and both think it is funny to sneeze loudly in public.

A Critical Look at the Twin Studies As compelling as these correspondences are, we must interpret them with care (Phelps et al., 1997). Let's begin that interpretation by putting on our critical thinking caps and confronting the same questions that puzzled Bouchard and his colleagues: What might account for the remarkable similarities they were uncovering in the lives of reunited identical twins? How much was genetics? How much was coincidence? Were there any other explanations that could account for their results? As so often happens in psychology, the answers are complex.

To see these two twin pairs in a broader perspective, you need to know that they are "outliers"—extreme among the twins studied at Minnesota, even though they have received the lion's share of media coverage. Although Bouchard and his colleagues found many unexpected developmental similarities between individuals in all the twin pairs they studied, most were not nearly so much alike as Oskar and Jack or the Jims. Bouchard acknowledges that many of the similarities are just coincidences (The Mysteries, 1998). Yet it is precisely such coincidences that make the news and catch our eye. Even so, cautions twin researcher Richard Rose, "If you bring together strangers who

were born on the same day in the same country and ask them to find similarities between them, you may find a lot of seemingly astounding coincidences" (Horgan, 1993). While mere coincidence does not offer a very dazzling explanation, the alternatives seem absurd. No one seriously suggests, for example, that the names of Betty and Linda could have been written into the genes of the two Jims or that heredity really specifies storing rubber bands on one's wrists.

The real story, then, is both less dramatic and more important: Identical twins do show remarkable similarities, but mainly in the characteristics you might expect: intelligence, temperament, gestures, posture, and pace of speech—all of which do make sense as traits that could be genetically influenced. And the fact that fraternal twins and other siblings show fewer similarities also suggests that hereditary forces are at work—in all of us, whether we are twins or not. Bouchard (1994) himself takes a rather extreme position, suggesting that heredity accounts for up to 80% of the similarities observed among identical twins (What We Learn, 1998). Critics aren't so sure.

Twin studies are one way to study the relative importance of nature and nurture, but they must be interpreted with caution. This photo shows the identical "Bob Twins," who, like the "Jim Twins," grew up not knowing of each other's existence. Both sport mustaches and smoke a pipe; both have engineering degrees; and both married teachers named Brenda. It is unlikely that all the similarities–striking as they may be–are caused by genetics.

Identical Twins Are Not Identical What objections do the critics raise concerning the twin studies Bouchard and his colleagues have been conducting? First, they note that, stunning as the similarities between identical twins may seem, the effect of the environment also shows up in each pair of twins. None of the twin pairs displays behavior that is identical across the board. And the fact that twins reared together typically are more alike than those reared apart provides further testimony to the effect of environment. The additional fact that the personalities of most twin pairs become less alike as they age provides still further evidence that the environment, as well as heredity, is at work (McCartney et al., 1990). We should note, too, that many of the twin pairs studied by Bouchard had been reunited for some time before he found them—an environmental condition that could easily accentuate, or even *create*, similarities. This was true, for example, of Oskar Stör and Jack Yufe, the Nazi and Jew twins, who met five months before Bouchard got to them. In fact, says psychologist Leon Kamin, Bouchard's twins face strong incentives to exaggerate their similarities and minimize their differences in order to please the research team and to attract media attention (Horgan, 1993). (Since their story broke in the press, Stör and Yufe have hired agents, made paid appearances on TV, and sold their story to a Hollywood film producer.)

A second sort of criticism points out that because identical twins look alike, people often treat them alike. This is an environmental factor that can easily account for many similarities in behavior. For example, some people's faces look good with moustaches, and if a pair of twins have such faces, people may encourage them to grow moustaches—whether or not they have been raised together. The resulting similarity, then, can be due as much to environment as to heredity.

Finally, the critics also remind us that scientists' hopes and expectations can influence their conclusions in this sort of research. Because Bouchard and other investigators of identical twins expect to find some hereditary influences, their attention will be drawn more to similarities than to differences. In fact, this is what people often do when they meet: Their conversation jumps from topic to topic until they discover common interests, attitudes, experiences, or activities.

CONNECTION: CHAPTER 1

The *expectancy bias* can distort perceptions and research findings.

Is there any point of consensus about the twin studies and about the effects of heredity and environment? Bouchard and his critics all would say that neither heredity nor environment ever acts alone to produce behavior or mental processes. They always *interact.* That is, from a developmental perspective, heredity and environment work together throughout a person's life. In addition, most would agree that the important findings coming out of the Minnesota twin research have nothing to do with unique and amazing similarities between particular twins. Rather, they have to do with the similarities found across all the identical twin pairs they studied: Twins show extraordinary similarities with each other in personality, attitudes, facial expressions, and temperament—almost everything, oddly enough, except their choice of mates: The spouses of identical twins were no more similar to each other than were people who would have been chosen at random (El-Hai, 1999). What the twin studies really did was to remind us that we are products of *both* heredity and environment—nature *and* nurture.

HOW DO PSYCHOLOGISTS EXPLAIN DEVELOPMENT?

Broadly speaking, **developmental psychology** is the psychology of growth, change, and consistency through the lifespan. It asks how thinking, feeling, and behavior change through infancy, childhood, adolescence, and adulthood. It also seeks to understand how the brain changes, how our bodies change, and what effects these changes have on sensation, perception, cognition, motivation, emotion, and personality. And developmental psychology seeks to discover the threads of consistency—the "who we are"—that provide continuity throughout our lives. Beyond describing change and consistency, developmental psychologists also want to understand the fundamental forces that *cause* development. And that, of course, is where the two broad influences of heredity and environment come in. For developmental psychology, the big questions about heredity and environment are (a) How much weight does each wield? and (b) How do they interact?

Psychologists often refer to this as the **nature–nurture issue:** *Nature* refers to the effects of heredity and *nurture* to the influence of environment. Because this issue is so central to developmental psychology, we have highlighted it in the first Core Concept of this chapter:

Development is a process of growth, change, and consistency brought about by an interaction of heredity and environment.

The most important word here is **interaction:** Heredity and environment are always entwined in an inseparable relationship. The story of development, then, is the story of the *nature–nurture interaction* over the lifespan.

■ **Developmental psychology** The psychological specialty that studies how organisms change over time as the result of biological and environmental influences.

■ **Nature–nurture issue** The long-standing discussion over the relative importance of nature (heredity) and nurture (environment) in their influence on behavior and mental processes.

■ **Interaction** A process by which forces work together or influence each other–as in the interaction between the forces of heredity and environment.

The Nature–Nurture Interaction

It was probably Shakespeare who first brought the terms *nature* and *nurture* together (Gottesman, 1997), when Prospero describes the futility of his efforts to civilize his beastlike servant Caliban:

> A devil, a born devil, on whose nature
> Nurture can never stick; on whom my pains,
> Humanely taken, all, all lost, quite lost . . .
>
> —*The Tempest,* Act 4, Scene 1

More important, Shakespeare seems to have grasped the idea that nature and nurture can work in partnership—the idea of *interaction* that has not always been obvious to others. Those who had missed this important point have long argued over which of these forces—nature *or* nurture—is the more important influence on our thoughts and behaviors. It also reappears in the debate over racial differences and gender differences, as we will see a few chapters hence.

Although people continue to ask, "Is it nature *or* nurture?" psychologists today are more interested in understanding how heredity and environment *work together* to produce our personalities and our mental abilities (Bronfenbrenner & Ceci, 1994; Dannefer & Perlmutter, 1990). We know that virtually every human characteristic (with the trivial exceptions of certain physical traits, such as eye color) is shaped by both an individual's biological inheritance and experience (de Waal, 1999). That is, *nature and nurture interact.* If you are good at, say, math or music, your ability is really the result of a combination of genetic potential and experience. Heredity establishes your potential, but experience determines how your potential will be realized. To put it yet another way: Nature *pro*poses, and nurture *dis*poses.

Still, we may ask: Which of our traits does heredity affect most? And which are most heavily influenced by learning or other environmental factors (such as disease or nutrition)? And it's worth noting that answering such questions can pose some hazards. For example, we know that in the genetic disorder known as Down syndrome, biology has a strong influence. In this condition, the output of abnormal chromosomes leads to mental retardation—and there is no cure. The hazard of knowing about the genetic basis for Down syndrome is that the parents or teachers of children with such disorders may simply conclude that biology determines the child's destiny and give up hope. By focusing on the genetic side of the disorder, they may overlook effective learning-based treatments that can measurably improve the living skills of these individuals.

Mindful of such dangers, psychologists have nevertheless forged ahead in the study of hereditary and environmental contributions to thought and behavior. To do so, they have invented several clever methods for weighing the effects of nature and nurture. These include studies of twins and studies of adopted children. Briefly, we will examine how these two methods work, as well as their strengths and weaknesses.

Twin Studies Twins, as we have seen in Bouchard's studies, can give us some tantalizing clues about the relative contribution of nature and nurture, especially when the twins have been separated since birth. But identical twins separated at birth and later reunited are a scarce resource. For that reason, psychologists have also devised ways to tease out the effects of nature and nurture from studies comparing identical and fraternal twins who were reared together. Because **identical twins** have precisely the same genotype and **fraternal twins** have (on the average) 50% of their genes in common, hereditary effects should show up more strongly in identical twins. (In studies comparing these two twin types, the fraternal twins serve as a sort of *control group*). Such studies have given us valuable information on the genetics of mental and behavioral disorders, including alcoholism, Alzheimer's disease, schizophrenia, depression, and panic disorder (Eley, 1997; Plomin et al., 1994; Pool, 1997).

■ **Identical twins** A pair who started life as a single fertilized egg, which later split into two distinct individuals. Identical twins have exactly the same genes.

■ **Fraternal twins** A pair who started life as two separate fertilized eggs that happened to share the same womb. Fraternal twins, on the average, have about 50% of their genetic material in common.

CONNECTION: CHAPTER 2

The *control group* in a study serves as a standard against which other groups can be compared.

Adoption Studies If you adopted a baby, would he or she grow up to resemble you more than the biological parents? This is the sort of question asked by psychologists who do adoption studies. By comparing the characteristics of adopted children with those of their biological and adoptive family members, developmental psychologists have yet another method for separating the effects of heredity and environment. Similarities with the biological family point to the effects of nature, while similarities with the adoptive family suggest the

influence of nurture. This work, in concert with twin studies, has revealed genetic contributions to a variety of psychological characteristics, such as intelligence, sexual orientation, temperament, and impulsive behavior (Bouchard, 1994; Dabbs, 2000; Hamer, 1997; Saudino, 1997; Wright & Mahurin, 1997).

Gradual versus Abrupt Change

Most of us cringe with embarrassment when our parents tell stories on us, especially about the "cute" things we said or did as children. What makes children's antics so cute, of course, is that they don't think like adults. But how do children *become* adults? Is there a predictable *pattern* they follow as their thought and language and social relationships become more and more adultlike? Such questions raise a second issue related to our Core Concept: whether the developmental changes produced by nature and nurture happen abruptly or gradually—whether we go through clearly defined "stages" or change more gradually and continually throughout our lives.

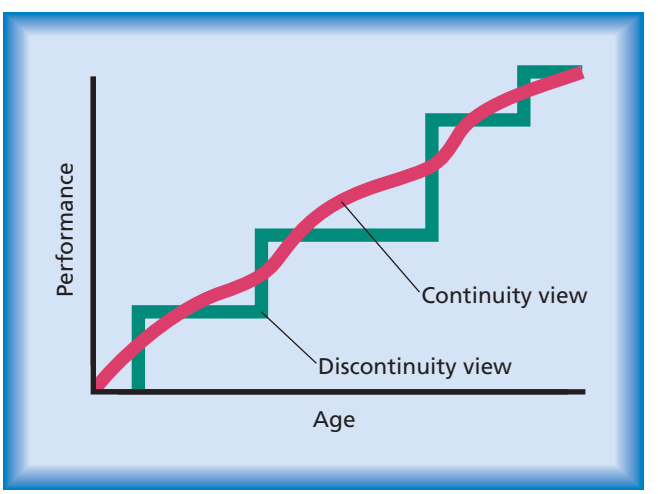
According to the **continuity view,** change is gradual. Children become more skillful in thinking, talking, or acting in much the same way that they become taller: through a gradual developmental process. We know that skilled behaviors often develop in this fashion, as you can see in the trial-and-error process of a child learning to walk or eat with a spoon. The more interesting question, of course, is whether complex mental processes, such as development of thought and language, follow the same pattern.

■ **Continuity view** The perspective that development is gradual and continuous–as opposed to the discontinuity (stage) view.
■ **Discontinuity view** The perspective that development proceeds in an uneven (discontinuous) fashion–as opposed to the continuity view.

Psychologists who take the opposing **discontinuity view** see development as more abrupt—as a succession of changes that produce different behaviors in different age-specific life periods, or *stages,* such as infancy, childhood, and adolescence. In this view, development can occur in bursts. That is, development can be *discontinuous.* You can observe this discontinuous process at work in beginning readers who suddenly discover the connection between letters and sounds. (For a graphical comparison of the continuity and discontinuity views, see Figure 9.1.)

You may have heard parents dismissing a child's misbehavior or moodiness as "just going through a

● In a remarkable series of self-portraits, we see developmental changes in the face of the painter Rembrandt.



● **FIGURE 9.1** Continuity versus Discontinuity
The continuity view sees development as a process of continual change, while the discontinuity view sees development as a series of steps, or stages.

stage," such as the "terrible twos," when children are becoming more mobile and independent. But for psychologists who subscribe to the discontinuity view, stages are not simply difficult times. These psychologists define **developmental stages** as periods of life initiated by distinct transitions (changes) in physical or psychological functioning. From a stage perspective, specific abilities, such as walking, talking, or abstract reasoning, appear at specific ages or life periods because different developmental processes come into play. In general, developmental psychologists who take the discontinuity view find that people go through the same stages in the same order—but not necessarily at the same rate.

■ **Developmental stages** Periods of life initiated by significant transitions or changes in physical or psychological functioning.

PSYCHOLOGY IN YOUR LIFE: PSYCHOLOGICAL TRAITS IN YOUR GENES

Eye color and the shape of your earlobes are purely genetic traits. Even some food aversions, such as a distaste for broccoli, can be anchored in the genes. But as far as we know, heredity by itself determines none of our more complex psychological characteristics (Horgan, 1993). Where personality traits, temperament, interests, and abilities are concerned, heredity always acts in combination with environment. Outgoing people, for example, aren't just born that way; they have also been encouraged to let their tendencies to extraversion show. Still, it's fair for developmental psychologists and biopsychologists to ask which psychological characteristics have strong genetic links.

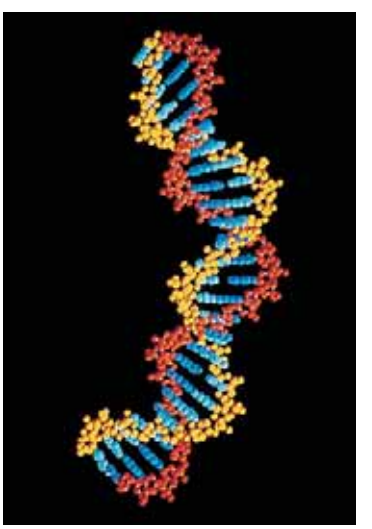
A genetic contribution to general intelligence, for example, is well established—although psychologists disagree over the magnitude of heredity's role (Plomin et al., 1994). There is also a good possibility that genes contribute to your sexual orientation (Hamer et al., 1993). And it just may be that an interest in skydiving, rock climbing, or other risky behavior has a substantial genetic component (Hamer, 1997). The evidence suggests that genes also contribute to your basic temperament and personality, including all of the "Big Five" personality factors (Bouchard, 1994; Plomin, 1997).

CONNECTION: CHAPTER 10

The *Big Five* are fundamental traits that reliably distinguish different personality patterns among people in all cultures.

Likewise, some clinical disorders are associated with genetic abnormalities (Eley, 1997; Gibbs, 1995; Mann, 1994; Plomin et al., 1994). One of the first to be discovered was Huntington's disease, a rare problem that causes aggressive behavior and mental deterioration beginning in midlife (Cattaneo et al., 2002). Depression, a far more common problem, can also have genetic roots (although this doesn't mean that everyone who gets depressed has a genetic problem). Similarly, twin studies have revealed a strong genetic contribution to schizophrenia, a major mental disorder. Fear, too, can have a hereditary basis, especially in those who suffer from a condition known as panic disorder. So can anxiety, the basis for repetitive "neurotic" rituals, such as compulsively checking and rechecking the alarm clock setting, seen in obsessive–compulsive disorder. There's also evidence that the violence that may occur in an antisocial personality and the uncontrollable outbursts of Tourette's syndrome stem ultimately from the genes. And, if you are older, you may worry that every instance of forgetting is a sign of Alzheimer's disease, which (in some forms) arises from a genetic flaw that takes first the memory and then the rest of the mind.

Thus we see that many psychological traits, both desirable and undesirable, have a connection to our genes, as well as in our experience. But, at the risk of playing the same tune too often, we must emphasize: Genetics is not everything. While heredity is involved in nearly all we do, human behaviors also are shaped by environment. And by "environment" we mean not only the influence of learning (including the impact of all our experiences) but also physical factors such as nutrition and physical stress (Brown, 1999).



● The genetic code, written in DNA, contains our complete hereditary blueprint, grouped into genes and chromosomes.

Unfortunately, people sometimes go to extremes by seeing hereditary effects everywhere. A strong hereditarian stance can, for example, lead to unfair labeling of people as having "bad blood" if they come from troubled or abusive families. Just as disturbing, hereditarian expectations can create complacency and self-centeredness in those whose parents have desirable characteristics, such as high intelligence or good looks. Either way, expectations about genetic influences can create a self-fulfilling prophecy, which leads people to live up (or down) to their expectations. If you expect to be smart and successful (or stupid and a failure), chances are you won't be disappointed.

CHECK YOUR UNDERSTANDING

1. **RECALL:** Psychologists have resolved the nature–nurture controversy by saying that we are the products of
   - **a.** heredity.
   - **b.** environment.
   - **c.** both heredity and environment.
   - **d.** neither heredity nor environment.
   - **e.** all our experiences.

2. **APPLICATION:** Which of the following statements is most accurate with regard to the "Jim twins"?
   - **a.** They are no more similar than other siblings.
   - **b.** It is reasonably certain that their similarities come from shared early experiences.
   - **c.** It has been proved that their similarities are just chance.
   - **d.** They are similar because they were raised in the same family environment.
   - **e.** We cannot say for certain that their similarities are mainly genetic.

3. **RECALL:** Which perspective says that developmental change is a gradual process?
   - **a.** the continuity view
   - **b.** the discontinuity view
   - **c.** the hereditarian view
   - **d.** the environmental view
   - **e.** the longitudinal view

4. **UNDERSTANDING THE CORE CONCEPT:** Which one of the following best exemplifies a developmental change that results from an interaction of heredity and environment?
   - **a.** the appearance of facial hair in a teenage boy
   - **b.** eye color
   - **c.** a child learning to talk
   - **d.** winning the lottery
   - **e.** hair color

ANSWERS: 1. c 2. e 3. a 4. c

WHAT CAPABILITIES DOES THE CHILD POSSESS?

People used to think that babies began life as a "blank slate"—with an empty brain and no abilities. In modern times, however, that picture has changed. We now see newborns as possessing a remarkable set of abilities that they acquired through their genes. They are social creatures, also adept at locating food and avoiding potential harm. These *innate* (inborn) abilities are the focus of the Core Concept for this section:

Newborns have innate abilities for finding nourishment, interacting with others, and avoiding harmful situations, while the developing abilities of infants and children rely more on learning.

To be sure, the newborn's capabilities are limited—but they are effective enough to promote survival. The newborn arrives in the world already "knowing," for example, how to get nourishment by suckling and how to get attention by cooing and crying. Still, it is helpful to think of the newborn's basic abilities as a sort of scaffold to which new and more complex abilities are added as the child grows and develops.

To explain where these abilities come from and how they develop, we will organize our discussion around three important developmental periods: the *prenatal* period, the *neonatal* (newborn) period, and *infancy.* You will notice that, in each phase, development builds on the abilities and structures laid down earlier.

Prenatal Development

The **prenatal period** spans the nine months between conception and birth. As every mother has sensed, it is a time of furious developmental activity that readies the organism for life on its own outside the womb. In this prenatal period, it passes successively through three stages, which we will describe in a bit more detail.

Shortly after conception, the fertilized egg, also known as a **zygote,** begins to grow through cell division. First one cell becomes two; then two become four; and when the number reaches about 150, the zygote implants itself in the lining of the uterus—a process that is completed about 10 days after conception. At this point it becomes an **embryo** (along with those cells that will form into the placenta and other supportive structures).

During the embryonic phase, the genetic plan determines how all the organs that will later be found in the newborn infant begin to form. In this stage, the embryo's cells begin to specialize as components of particular organ systems, a process known as *differentiation.* (Before differentiation, certain cells in the embryo, known as *embryonic stem cells,* are capable of forming into any organ of the body.)

At first, the embryo's cells form distinct layers. Those in the outer layer become the nervous system and the skin. Cells in the middle layer become muscles, bones, blood vessels, and certain internal organs. Those in the inner layer differentiate on a path that will eventually make them into the digestive system, lungs, and glands. By the end of the first month the initial single cell of the zygote has developed into an embryo with millions of specialized cells. Eventually this process of cell division and differentiation, which continues throughout the prenatal period, produces all the tissues and organs of the body.

The first rudimentary "behavior"—a heartbeat—appears when the embryo is about three weeks old and one-sixth of an inch long. A few weeks later, when it is not yet an inch in length, the embryo makes reflexive responses to stimulation. These behaviors occur long before the brain has developed to the point where it can think or direct behaviors.

After the eighth week, the developing embryo is called a **fetus.** Spontaneous movements commanded by the somatic nervous system begin at about this time, although the mother doesn't usually feel these movements until the 16th week after conception (Carmichael, 1970; Humphrey, 1970). By this point, the fetus has grown to about 7 inches long (the average length at birth is 20 inches).

Teratogens: Prenatal Toxins Specialists used to think that the womb shielded the developing organism from nearly all environmental assaults, but we now know better. Although the **placenta** (an organ that develops between the embryo/fetus and the mother) screens out some potentially dangerous substances, many can pass through this interface. These toxic substances, called **teratogens,** include viruses (including HIV, the AIDS virus), certain drugs, and other chemicals. Among the most common teratogens are nicotine and alcohol.

The effects of these teratogens vary from slight to devastating, depending on the type, amount of exposure, and stage of prenatal development in which exposure occurs. Fetal alcohol syndrome is one of the more worrisome disorders that can occur in children of mothers who drink heavily during pregnancy. The symptoms can include mental retardation, poor motor coordination, impaired attention, and hyperactivity.

As the brain grows in the developing embryo, it forms as many as 250,000 new neurons per minute.

- **Prenatal period** The developmental period before birth.
- **Zygote** A fertilized egg.
- **Embryo** In humans, the name for the developing organism during the first eight weeks after conception.
- **Fetus** In humans, the term for the developing organism between the embryonic stage and birth.
- **Placenta** The organ interface between the embryo or fetus and the mother. The placenta separates the bloodstreams, but it allows the exchange of nutrients and waste products.
- **Teratogens** Substances from the environment, including viruses, drugs, and other chemicals, that can damage the developing organism during the prenatal period.

Prenatal Development of the Brain Prenatally, the brain grows new neurons at the amazing rate of up to 250,000 per minute. By birth it has produced some 100 billion (Dowling, 1992). All originate from a proliferation of cells at the top of the embryo's hollow *neural tube.* (Your own brain and spinal cord have a hollow core that harks back to your embryonic days.) These furiously multiplying cells eventually become the brain; but to do so, they must embark on a once-in-a-lifetime journey. As new brain cells are produced, they actually migrate out of the neural tube and then extend their axons and dendrites to make connections with other newly formed neurons. Exactly how they manage to make the proper connections to form a functioning brain is still the subject of much research. The basic plan for "wiring" the brain, however, must be contained in the genetic code.

The Neonatal Period: Abilities of the Newborn Child

What is the sensory world like for the newborn? The father of American psychology, William James, guessed that everything must be an overwhelming jumble of stimuli—"One great blooming, buzzing confusion" (James, 1890). We now know that his views grossly underestimated infants' capabilities. Long before babies achieve motor coordination and locomotion, they take in vast amounts of information about their surroundings, filtering and processing stimulation that attracts, interests, or upsets them. They also have an amazing behavioral repertoire that they use to respond to and manipulate their environment.

During the **neonatal period** (newborn period), which covers the time from birth to one month of age, neonates are capable of responding to stimulation from all of their senses. For example, newborn babies will turn their heads toward anything that strokes their cheeks—a nipple or a finger—and begin to suck it. They can also respond to taste: the sweeter the fluid, the more continuously and forcefully an infant will suck (Lipsitt et al., 1976). They smile when they smell banana essence, and they prefer salted to unsalted cereal (Bernstein, 1990; Harris et al., 1990). However, they recoil from the taste of lemon or shrimp or the smell of rotten eggs. And, as early as 12 hours after birth, they show distinct signs of pleasure at the taste of sugar water or vanilla. All these responses are part of the ability the newborn has to seek nourishment—as the Core Concept for this section suggested.

What else can newborns do with their senses? Minutes after birth, their eyes scan their surroundings, although their vision is not, at first, especially sharp. In fact, babies are born rather nearsighted, with an optimal focus of about 12 inches—ideal for looking at faces. Their distance vision, however, is poor, with a visual acuity of about 20/500 (which means that they can discriminate at 20 feet stimuli that most older children can see clearly at 500 feet). Moreover, good vision requires the operation and coordination of a great many receptor cells in the eye's retina, in the visual pathways, and in the occipital cortex of the brain. At birth, relatively few of these connections are laid down. But these immature systems develop very rapidly, and the baby's visual abilities soon become quite effective (Banks & Bennett, 1988).

Early on, infants can perceive large objects that display a great deal of contrast. By the age of one month, a child can detect contours of a head at close distances. At seven weeks, the baby can scan the features of the caregiver's face, and, as the caregiver talks, the baby can contact his or her eyes. Just as heredity biases infants to prefer human voices over other sounds, it programs them to prefer human faces to most other visual patterns (Fantz, 1963). Although newborns can see colors, their ability to differentiate colors, such as red from orange from blue, becomes dramatically better a month or two after

■ **Neonatal period** In humans, the neonatal (newborn) period extends through the first month after birth.

birth (Teller, 1998). At three months, the baby can perceive depth and is well on the way to enjoying the visual abilities of adults. And it may surprise you to know that infants seem to possess a rudimentary ability to "count" objects they see: They know, for example, the difference between two dolls and three (Wynn, 1992, 1995). Such *core knowledge* serves as the foundation for the later development of more complex skills, such as are required for arithmetic (Spelke, 2000). They also have strong auditory preferences, one being a greater attraction to female voices than to those of men. Neonates also shift their attention to sound patterns they have heard before, and within a few weeks of birth they begin to recognize their mothers' voice (Carpenter, 1973; DeCasper & Fifer, 1980; DeCasper & Spence, 1986; Spelke & Owsley, 1979).

Aside from their sensory abilities, babies are born with a remarkable set of behavioral reflexes that provide a biological platform for later development. Among these reflexes, the *postural reflex* allows babies to sit with support, and the *grasping reflex* enables them to cling to a caregiver. And, in their cooing and crying, babies also have some rudimentary tools for social interaction. These and other innate responses equip newborns with the essential tools for survival and "instinctive" know-how. In addition, babies have built-in safety features that help them avoid or escape from unpleasant stimulation, such as loud noises, bright lights, strong odors, and painful stimuli. All of this, of course, makes much evolutionary sense because these abilities are highly adaptive and promote survival.

Infancy and Childhood: Building on the Neonatal Blueprint

Following the neonatal period, the child enters **infancy,** a period that lasts until approximately 18 months of age—the time when speech has become well developed. (The Latin root *infans* means "incapable of speech.") It is a time of rapid, genetically programmed growth and still-heavy reliance on the repertoire of reflexes and "instinctive" behaviors that we discussed above. All of these abilities arise from a nervous system that continues to develop at a furious pace. At birth and for the first few years of life, many potential brain circuits are not fully connected, a fact that helps to explain why most people have a poor memory for events that occurred before they were about 3½ years of age (Bauer, 2002; Howe & Courage, 1993). In order to complete the process of forming the brain's circuitry, the neonatal brain shifts its emphasis from producing new cells to a different mode of growth. The genetic program now emphasizes the branching of axons and dendrites (Kolb, 1989). As the dendrites and axons grow and connect, the total mass of neural tissue in the brain continues to increase rapidly—by 50% in the first two years. By 4 years of age it has nearly doubled its birth size.

As nerve fibers grow and connections form in the young brain, stimulation is necessary to make them permanent and functional. Those connections that are not used are lost through a process called *synaptic pruning.* This destruction of unused connections does not destroy the neurons themselves. Rather it returns them to an uncommitted state, awaiting a role in future development (Johnson, 1998). In some cases, however, vital neural connections may be broken, as can happen in children born with congenital cataracts of the eyes. If the cataracts are not treated early, neural connections in the visual system are irretrievably lost.

The genetic program (along with the physical limitations imposed by the size of the skull) does not allow the tremendous growth of brain circuitry to continue indefinitely. So, the neural growth rate gradually diminishes. Finally, by about 11 years of age, the brain attains its ultimate mass.

■ **Infancy** In humans, infancy spans the time between the end of the neonatal period and the establishment of language—usually at about 18 months to 2 years.

Learning Assumes a Role in Development Infancy is also a period during which youngsters begin to exploit their abilities for *learning*. Babies start to build up their knowledge of the world by observing relations between important sensory events, as when a certain tone of the mother's voice signals it is time to eat. This involves a fundamental form of learning that psychologists call *classical conditioning* (it's the same sort of learning that makes your mouth water at the sight of a pizza or makes some people faint at the sight of blood). This form of learning in babies was demonstrated by an experiment in which newborns were taught to anticipate pleasurably sweet sensations by first stroking the babies' foreheads and then giving them sugar water. After several trials, the stroking alone would cause the babies to turn their heads in the direction from which the sweet fluid had been delivered—a learned anticipation of more of the same (Blass, 1990).

CONNECTION: CHAPTER 6
Classical conditioning is a form of learning, originally studied by Pavlov, in which one event signals the occurrence of another.

Infants also use their learning ability to expand their social interaction skills. We have seen, for example, that young babies can learn to distinguish their mother's voice. Likewise, they learn to associate their caregiver with certain odors. And, as any parent will tell you, babies quickly learn how to manipulate their parents by cooing, smiling, and crying. Learning and memory also underlie the surprising ability of newborns to imitate simple facial expressions, such as sticking out the tongue or rounding the mouth (Meltzoff, 1998; Meltzoff & Prinz, 2002). In general, as development proceeds through infancy, learning assumes an ever-larger role in producing even more complex behaviors.

Social Abilities As the foregoing discussion suggests, infants are built for social interaction, and they not only respond to, but also interact with, their caregivers from the moment of birth. Film studies of this interaction reveal a remarkable degree of *synchronicity:* close coordination between the gazing, vocalizing, touching, and smiling of mothers and infants (Martin, 1981). And while babies respond and learn, they also send out messages to those willing to listen to and love them. The result of this interaction can be seen in studies showing how the feelings of mothers and infants are coordinated (Fogel, 1991). So, a 3-month-old infant may laugh when his or her mother laughs and frown or cry in response to her display of negative emotion (Tronick et al., 1980).

Attachment Ideally, social development begins with the establishment of a close emotional relationship between a child and a parent figure. Psychologists call this **attachment,** although the popular media often refer to it as "bonding." By either name, this relationship is especially important because it lays the foundation for all other relationships that follow.

CONNECTION: CHAPTER 8
Instinct is a common but imprecise term that refers to behaviors that have a strong genetic basis.

Attachment behaviors appear to occur "instinctively" in many species, although they are not necessarily limited to the infant's interactions with the biological parents. One striking example occurs in **imprinting,** the powerful attraction of infants of some species (notably in birds) to the first moving object or individual they see. A baby chick hatched by a mother duck will form an attachment to its surrogate mother—even though it is a chicken, not a duck. The imprinted chick will even follow its duck-mother right up to the water's edge when she and her ducklings go for a swim. (You may also recall *The Ugly Duckling,* the children's tale about imprinting.) Thus, the imprinting tendency is an innate predisposition, although the organism's environment and experience determine what form it will take. While imprinting occurs most clearly in birds, a similar, but more complex, process may account for the attachment between human infants and their caregivers.

■ **Attachment** The enduring social-emotional relationship between a child and a parent or other regular caregiver.
■ **Imprinting** A primitive form of learning in which some young animals follow and form an attachment to the first moving object they see and hear.

Although humans apparently have an inborn need for attachment, there is no guarantee that parents will always respond to this need. What, then, can

babies do to increase the chances of getting the contact they want? Unlike a baby chick, human babies are not mobile enough at birth to use their own locomotion to get closeness or attention from a caregiver. When they want to get close to the attachment figure (e.g., their mother), they cannot simply crawl or move toward her. But they can emit signals—such as smiling, crying, and vocalizing—to promote responsive behavior (Campos et al., 1983). And few can resist a baby's smile! According to John Bowlby (1973), infants will form attachments to any individual who consistently and appropriately responds to their signals.

● Konrad Lorenz (1903–1989), a researcher who pioneered the study of imprinting, dramatically demonstrated what can happen when young birds become imprinted on an object other than their mother.

Some observers have suggested that attachment begins as early as the first few weeks (Ainsworth, 1973; Ainsworth et al., 1978; Bowlby, 1969, 1973). One study found, for example, that when mothers left the room, their 2- to 4-month-old babies' skin temperature dropped, a sign of emotional distress (Mizukami et al., 1990). In these youngsters, skin temperature dropped even more when a stranger replaced the mother. In contrast, skin temperature remained steady if the mother stayed in the room—even if the stranger was present. Apparently, children only a few months old rely on their caretakers as a "safe base," even before they can indicate attachment with crying or locomotion (Bee, 1994).

The Strange Situation Developmental psychologist Mary Ainsworth spent a career studying the various forms attachment takes. She did this by observing young children in a variety of carefully contrived "strange situations." For example, she separated children from their mothers by a barrier or placed them alone in an unfamiliar room (Ainsworth, 1989; Ainsworth et al., 1978; Ainsworth & Wittig, 1969; Lamb, 1999). Using such methods in a variety of cultures, Ainsworth found that the children's responses fell into two main categories, reflecting either secure attachment or insecure attachment. Securely attached children felt close to their mothers, safe, and more willing to explore or tolerate a novel experience—confident that they could cry out for help or be reunited with the missing parent. Insecurely attached children were more likely to react to the "strange situation" in one of two ways: with anxiety and ambivalence or with avoidance. The anxious-ambivalent children wanted contact but cried with fear and anger when separated and proved difficult to console even when reunited with their mothers. The avoidant children acted as though they were unconcerned about being separated from their mothers, not crying when they left and not seeking contact when they returned. Avoidant children may be showing the effects of repeated rejection, no longer seeking attachment because their efforts have failed in the past (Shaver & Hazan, 1994).

● Children become attached to their caregivers, and parents likewise become attached to their children. Love and responsibility help offset the daily struggles for survival faced by poor families the world over.

Attachment fascinates researchers because patterns established in infancy may persist in a variety of childhood and even adult behaviors, influencing later-life job satisfaction, relationship choices, and intimacy experiences—although the current research carries mixed messages on this issue. (See Berk, 2004, for a more detailed review.) As children grow up and become adults, they no longer restrict their attachment to their primary caregiver. While they may retain their childhood attachment style, they gradually widen their attachments to include peers, friends, teachers, coworkers, and others in their community. We should emphasize, however, that—powerful as attachment is—individuals who lack healthy attachments in infancy and childhood are not necessarily doomed to failure in life. Attachment problems are good predictors of later problems with social relationships, but many people do succeed in overcoming attachment difficulties (Kagan, 1996, 1998). Further, cross-cultural psychologists have cautioned us that attachment patterns may differ somewhat from culture to culture. For example, Japanese mothers make more physical

DO IT YOURSELF! What's Your Attachment Style?

Indicate which one of the following three self-descriptions you most agree with (adapted from Shaver & Hazan, 1994):

1. I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and love partners often want me to be more intimate than I feel comfortable being.
2. I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner, and this sometimes scares people away.
3. I find it relatively easy to get close to others and am comfortable depending on them. I don't often worry about being abandoned or about someone getting too close to me.

WHAT YOUR CHOICE MEANS

We realize that it is probably obvious to you which of the statements above is "best." Nevertheless, just considering the alternatives should help you understand attachment styles–and, perhaps, yourself–a little better. Here's our interpretation: If you selected the first statement, you agreed with the attitude that reflects an avoidant, insecure attachment. This style was chosen by 25% of Shaver and Hazan's respondent sample. The second statement reflects an anxious-ambivalent, insecure attachment style, selected by 20% of the sample. The third statement reflects a secure attachment style, the most common pattern identified, accounting for 55% of respondents (Shaver & Hazan, 1994).

What do these styles signify for later life? Through interviews, observations, and questionnaires, researchers have identified several consequences of attachment style, secure or insecure, in adulthood (see Ainsworth, 1989; Collins & Read, 1990; Hazan & Shaver, 1990; Kirkpatrick & Shaver, 1992; Shaver & Hazan, 1993, 1994; Simpson, 1990):

- Secure individuals have more positive self-concepts and believe that most other people are good-natured and well-intentioned. They see their personal relationships as trustworthy and satisfying.
- Secure respondents are satisfied with their job security, coworkers, income, and work activity. They put a higher value on relationships than on work and derive their greatest pleasure from connections to others.
- Insecure, anxious-ambivalent persons report emotional extremes and jealousy. They feel unappreciated, insecure, and unlikely to win professional advancement. They make less money than those with other attachment styles, working more for approval and recognition than for financial gain. They fantasize about succeeding but often slack off after receiving praise.
- Avoidant people fear intimacy and expect their relationships to fail. They place a higher value on work than on relationships and generally like their work and job security. They follow a workaholic pattern, but (not surprisingly) they are dissatisfied with their coworkers.
- Secure individuals tend to choose as partners others who are secure. After breakups, avoidant individuals claim to be less bothered by the loss of the relationship, although this may be a defensive claim, with distress showing up in other ways (e.g., physical symptoms).

contact with infants, while American mothers make more eye contact (Rothbaum et al., 2000b). With such caveats in mind, we now invite you to take the quiz in the "Do It Yourself!" box "What's Your Attachment Style?"

Contact Comfort Why do infants become attached to caregivers in the first place? An evolutionary explanation says that attachment safeguards an infant's survival by assuring the support and protection it requires. Through natural selection, individuals with genetic tendencies to "attach" will survive, thrive, and pass those tendencies along to their own offspring.

In addition to affording protection, could attachment also be the child's way of encouraging the parents to provide food—its most basic physical need? This idea has been dubbed the "cupboard theory": Infants become attached to those who provide the "cupboard" containing the food supply. This theory has been a favorite of those who believe that nursing is the basis for healthy relationships. But does the cupboard theory really explain the parent–child bond?

To understand how psychologists have dealt with this issue, we have to imagine the way many people looked at child rearing in the 1940s and 50s, when the cupboard theory prevailed. Freud had convinced most physicians that young infants and children were so mentally undeveloped that the only thing of real importance in their lives was the breast or the bottle. Nothing like adult social relationships entered their little minds—which explains why no one worried about the lack of touching or other displays of affection given premature infants in incubators or older children in orphanages (Blum, 2002; Sapolsky, 2002).

Psychologists Harry and Margaret Harlow guessed that a more fundamental cause of attachment involves physical contact (Harlow, 1965; Harlow &

Harlow, 1966). To see if they were right, they decided to test this idea against the cupboard theory in an animal model, using infant monkeys who had been separated from their mothers at birth. The Harlows placed orphaned baby monkeys in cages where they had access to two artificial *surrogate mothers.* One was a simple wire figure that provided milk through a nipple—a "cupboard," but little else. The other was a cloth-covered figure providing no milk but offering abundant stimulation from its soft terry-cloth cover. Confirming their expectations, the Harlows observed that their baby monkeys spent many hours nestled close to the cloth mother but little time with the wire model, despite the nourishment the latter provided. Moreover, when the baby monkeys were frightened, they sought comfort by clinging to the cloth figure. They also used it as a base of operations when exploring new situations. With these observations, then, the Harlows were able to show that the infant monkeys become attached to and prefer a "mother" figure that provides **contact comfort,** the stimulation and reassurance derived from physical touch.

Human infants need contact comfort, too. The lack of a close, loving relationship in infancy even affects physical growth. We know this from observations of children in emotionally detached or hostile family environments: Such children have slower growth and bone development. They may grow again if removed from the poor environment, but their growth is stunted again if they are returned to it, a phenomenon known as *psychosocial dwarfism.* A related condition, which has no organic basis but results from lack of parental love and nurturing, is known as *failure to thrive,* seen in wasted-looking, withdrawn, and apathetic infants. Accordingly, in some hospitals that recognize the power of contact comfort, premature infants and others born at risk are scheduled to receive regular holding and cuddling by staff members and volunteers. Clearly, a close, interactive relationship with loving adults is a child's first step toward healthy physical growth and normal socialization.

One of Harlow's monkeys and its artificial terry-cloth mother. Harlow found that the contact comfort mothers provide is essential for normal social development.

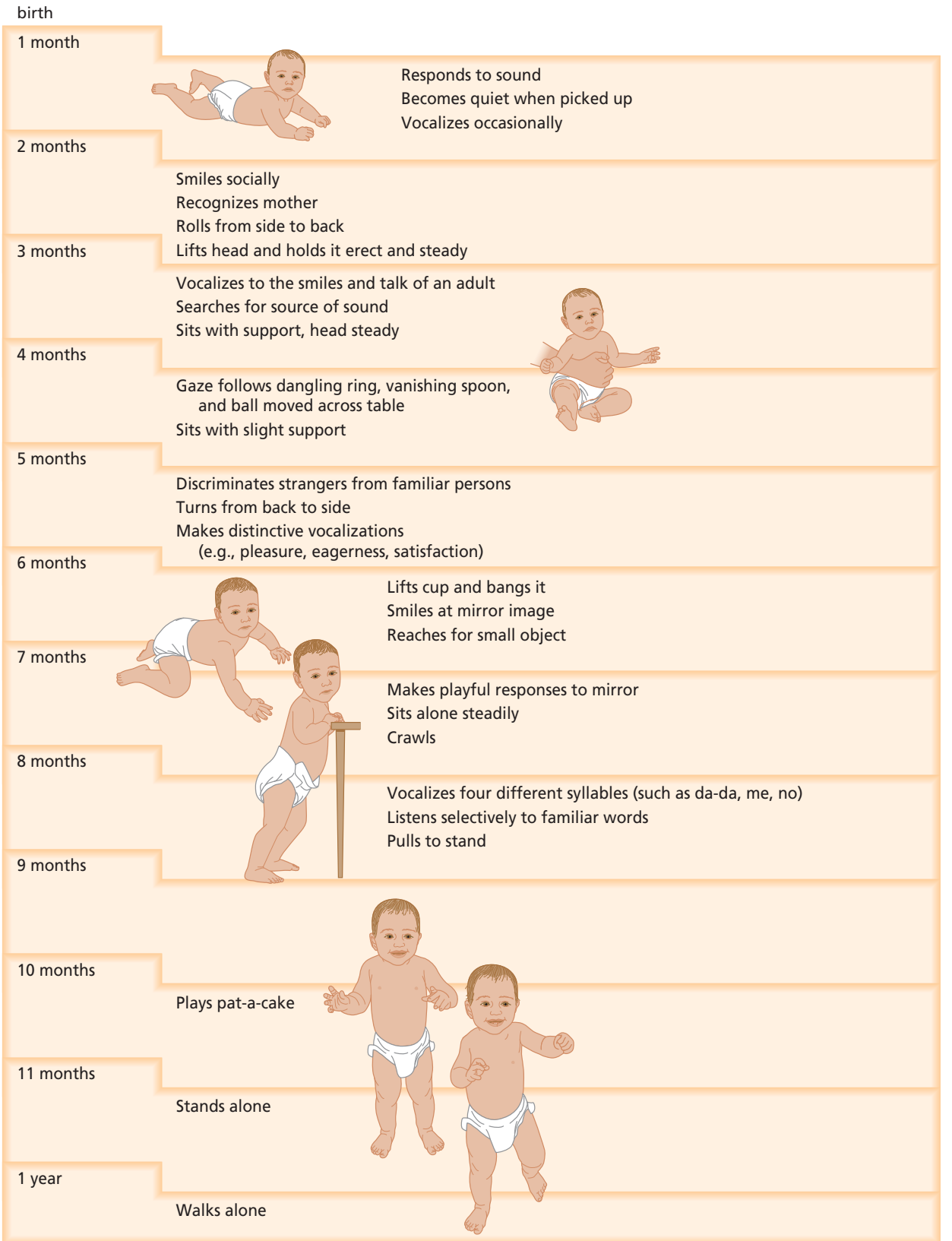
Maturation and Physical Abilities Sitting, crawling, and walking—like the growth of the brain, the growth spurt of puberty, and the onset of menopause—all occur on their own biological time schedules. Psychologists use the term **maturation** for the unfolding of these genetically programmed processes of growth and development over time. When organisms are raised under adequate environmental conditions, their maturation follows a predictable pattern. In humans, maturation generates all of the sequences and patterns of behavior seen in Figure 9.2.

Even when maturation takes the leading role, we must keep in mind the *interaction* of biology and environment. Thus, in the sequence for motor control shown in Figure 9.2, a child learns to walk without special training, following a time-ordered pattern that is typical of all physically capable members of our species. Indeed, in cultures where children are carried in cradle boards, walking occurs on a similar schedule (Dennis & Dennis, 1940). Despite this hereditary pattern, however, we find that environmental influences can sometimes play a part. In the West Indies, where infants receive vigorous massage after the daily bath and frequent practice in moving their legs while being held, children sit and walk a little earlier, on the average, than do children in the United States (Hopkins & Westra, 1988). On the other hand, lack of human contact can have the opposite effect, as in children who had spent their lives lying in cribs in Iranian orphanages were observed to be very slow in learning to sit and walk (Dennis, 1960).

Harking back to our discussion of continuity and discontinuity, physical growth in humans has always been viewed as a *continuous* process whose rate changes with age, slowing over time after a rapid start in the early years. This picture of continuous physical growth has been qualified, however, as the

Contact comfort Stimulation and reassurance derived from the physical touch of a caregiver.

Maturation The process by which the genetic program manifests itself over time.



● **FIGURE 9.2** Maturational Timetable for Motor Control

This figure shows average ages at which each behavior is performed. There are considerable individual differences in the *rate* of development, so the time at which each response occurs is variable. Most infants, however, follow the *sequence* of development outlined here.

result of reports showing that growth in the length of infants' bodies occurs in discontinuous "bursts." Developmentalists call this *saltation* (from the Latin *saltare,* "to leap"). In fact, all through infancy and childhood, physical growth involves an alternation between active and inactive growth phases (Lampl et al., 1992). Typically, infants go for several days showing no growth at all, and then suddenly they enter a growth spurt, in which they can add as much as one-half inch in length in 24 hours!

To summarize, we have seen that neonates come equipped to accomplish three basic tasks of survival: finding sustenance (feeding), maintaining contact with people (for protection and care), and defense against harmful stimuli (withdrawing from pain or threat). Such tasks require a set of innate abilities, and these abilities, in turn, form a foundation on which learning and physical maturation build the perceptual skills, the ability to understand experiences, and basic thinking skills that continue to develop during infancy, childhood, and throughout life (von Hofsten & Lindhagen, 1979).

PSYCHOLOGY IN YOUR LIFE: DOES YOUR CHILD MEASURE UP?

It is risky to discuss the ages by which a child "should" achieve certain physical and mental skills. Children show great variation in their development. Some children walk by 11 months, about half do so by their first birthdays, and nearly all achieve this milestone by 15 months of age. So if your child, or a child you know, hasn't started walking and talking by age 1, you shouldn't panic. Likewise, you shouldn't be worried if your child isn't talking by the average time suggested in the baby books. Einstein was slow to talk, too.

On the other hand, large differences from the averages should not be ignored. If a child still isn't beginning to walk and talk by age 2, the caregiver should consult a specialist, such as a pediatrician or developmental psychologist, to see whether something is wrong. It is well to remember, also, that a delay in one area, such as the onset of speech, does not mean that the child is "retarded" or will be generally slow in other areas. Not only are there great variations among children, but variations occur normally within an individual child.

What developmental standards would a specialist use? Certainly, a child should be responsive to people almost from the moment of birth. All the major reflexes discussed in the previous section should be present. (These should be checked by the pediatrician.) Then, as the child develops, you will want to watch at the appropriate times for the abilities listed in Figure 9.2. Doing so will not only help you follow the child's progress but also make you more knowledgeable about the process of psychological development.

CHECK YOUR UNDERSTANDING

1. **RECALL:** Which of the following does not appear before birth?
   - **a.** the heartbeat
   - **b.** movement of limbs
   - **c.** growth and migration of neurons
   - **d.** vocalizations
   - **e.** all appear before birth

2. **RECALL:** After birth, brain development emphasizes the
   - **a.** migration of neurons.
   - **b.** development of connections among neurons.
   - **c.** development of the brain stem.
   - **d.** multiplication of neurons.
   - **e.** function of individual neurons

3. **APPLICATION:** You are a psychologist working in a pediatric hospital. What would you recommend as one of the most important things that the staff could do for newborn babies to promote their healthy development?
   - **a.** Talk to them.
   - **b.** Begin toilet training them.
   - **c.** Make eye contact with them.
   - **d.** Feed them on a fixed schedule.
   - **e.** Touch them.

4. **APPLICATION:** You would expect your newborn baby to
   - **a.** quickly learn to recognize the sound of his or her name.
   - **b.** react negatively to a taste of lemon.
   - **c.** prefer the father's deeper voice to the mother's higher voice.
   - **d.** smile when eating.
   - **e.** mimic facial expressions.

5. **RECALL:** Mary Ainsworth found two main types of attachment,
   - **a.** shy and bold.
   - **b.** introverted and extraverted.
   - **c.** secure and insecure.
   - **d.** strong and weak.
   - **e.** nature and nurture.

6. **UNDERSTANDING THE CORE CONCEPT:** Which one of the following is an innate ability that promotes survival?
   - **a.** the grasping reflex
   - **b.** recognition of the mother's face
   - **c.** toilet training
   - **d.** sharp vision
   - **e.** smell

ANSWERS: 1. d 2. b 3. e 4. b 5. c 6. a

WHAT ARE THE DEVELOPMENTAL TASKS OF INFANCY AND CHILDHOOD?

Two of the greatest accomplishments of your life are developing your ability to think and reason, and forming relationships with the important people in your life. (Another is acquiring your native language, which we discuss in Chapter 7.) Each of these serve as the basis for further development later in life. And we will see that as children work through these tasks, they undergo profound psychological changes. Here's how our Core Concept states the main idea of this section:

Infants and children face especially important developmental tasks in the areas of cognition and social relationships—tasks that lay a foundation for further growth in adolescence and adulthood.

As we will see below, the developmental differences between children and adults are huge, but the differences in thought and socialization are not simply the result of adults' greater experience or store of information. The differences between children and adults also involve the unfolding of crucial maturational processes. Let us first consider cognitive development.

Cognitive Development: Piaget's Theory

If you have ever known a toddler going through the naming explosion, you have seen that children have an insatiable appetite for labeling things they know. Behind this labeling is their emerging ability for thinking, perceiving, and remembering. The next few pages will focus on the ways in which these mental abilities emerge, a process called *cognitive development*.

Psychologists interested in cognitive development ask such questions as: When do children realize that objects still exist even when they can't see them? Do they know that it is possible to hold ideas that aren't true? Can they understand that people have desires and dreams, but objects do not? Developmental psychologists investigate not only *what* children think but *how* they think.

In this section we will emphasize the pioneering work on cognitive development by the late Swiss psychologist Jean Piaget (although there are other

points of view). For nearly 50 years, Piaget observed children's intellectual development and formulated his observations into a comprehensive theory.

Piaget began this quest to understand the child's mind by carefully observing the behavior of his own three children. His methods were simple: He would pose problems to them, observe their responses, slightly alter the situations, and once again observe their responses. Piaget attended especially to the developmental transitions and changes in his children's thinking, reasoning, and problem solving. This focus led to a *discontinuous stage model* of development, which emphasized Piaget's view that children undergo a revolution in thought at each stage. We will see below that three key ideas distinguish Piaget's approach: (1) *schemas,* (2) the interaction of *assimilation* and *accommodation,* and (3) the *stages of cognitive development.*

Although an infant will begin to suck a bottle just the way he or she sucked a breast (assimilation), the infant will soon discover that some changes are necessary (accommodation). The child will make an even greater accommodation in the transitions from bottle to cup.

Schemas To illustrate the concept of schemas, think of some four-legged animals. Now think of some that are friendly. Then think of one that barks. You might have started by imagining elephants, tigers, cats, and dogs (all four-legged), then narrowed your choices down to cats and dogs (four-legged and friendly), and finally to just dogs (which bark). You could do this easily only because you have developed mental structures (mental programs) that enable you to interpret concepts and events. Piaget termed such mental structures **schemas.** We have schemas for concepts, such as "dog" and "development." We have schemas for actions, such as eating with chopsticks. We also have schemas for solving problems, such as finding the area of a circle or dealing with a crying baby. In general, schemas are mental structures that guide thinking. According to Piaget, they are also the building blocks of development. Schemas form and change as we develop and organize our knowledge to deal with new experiences and predict future events. As you read this, you are building a schema about schemas!

Accommodation occurs when this child learns that a butterfly does not fit his schema for "bird."

Assimilation and Accommodation In Piaget's system, two dynamic processes underlie all cognitive growth: *assimilation* and *accommodation.* **Assimilation** is a mental process that modifies new information to fit with existing schemas—with what is already known. A baby who knows how to suck from a nipple will use assimilation to deal with new objects such as a finger or a new toy. Likewise, an older child might assimilate a new word such as "pepperoni" to describe a favorite kind of pizza. You, too, experience assimilation when you read about a favorite actor's new film or gain skill in using a new program on your computer.

By contrast, **accommodation** is a process of *restructuring or modifying schemas* to incorporate new information. For example, a child's simplistic "bird" schema, which includes any flying object, undergoes accommodation when the child learns that a butterfly is not a bird. Adults experience accommodation of their mental schemas, too. For example, the Internet has caused widespread accommodation in the schemas people use to conceptualize shopping and communicating. You, too, may need to modify a schema when the professor in your psychology course says something that surprises you—such as, "Children have innate language abilities," when you had always assumed that language was acquired entirely by learning. As a result, your schema about newborn children may change to accommodate your new knowledge.

■ **Schemas** In Piaget's theory, mental structures or programs that guide a developing child's thought.
■ **Assimilation** A mental process that modifies new information to fit it into existing schemas.
■ **Accommodation** A mental process that restructures existing schemas so that new information is better understood.

● Object permanence, the perception that objects exist independently of one's own actions or awareness, develops gradually during the first stage of cognitive development and is solidly formed before age one. The baby in these pictures clearly believes that the toy no longer exists once it is obscured by the screen.

For Piaget, cognitive development results from the continual interweaving of assimilation and accommodation. Through these two processes, the individual's behavior and knowledge become less dependent on concrete external reality and more reliant on internal thought. In general, *assimilation* makes new information fit our existing views of the world, and *accommodation* changes our views to fit new information.

Piaget's Stages of Cognitive Development The way a child thinks about the world progresses through four revolutionary changes. Piaget described these changes in terms of four stages of cognitive growth: the *sensorimotor stage* (infancy), the *preoperational stage* (early childhood), the *concrete operational stage* (middle childhood), and the *formal operational stage* (adolescence). At each stage, distinct styles of thinking emerge as the child progresses from sensory reaction to logical thought. It is important to note that all children progress through these stages in the same sequence, although one child may take longer to pass through a given stage than does another child.

The Sensorimotor Stage (Birth to about age 2) We have seen that children enter the world equipped with many innate and reflexive behaviors, such as those for clinging, sucking, and crying. None of these require thought—in the sense of the complex mental activity seen in problem solving later in childhood. Instead, children in the **sensorimotor stage** give mainly reflexive or "instinctive" motor responses to stimulation, with very little "thinking" involved. Piaget called this *sensorimotor intelligence.* Not everything is automatic, however. As we have seen, children at this stage are also capable of simple learning, even though the circuitry in the cortex is not yet well connected. They learn to recognize people they see frequently. And they learn to coordinate their body parts to grasp and explore attractive objects (a rattle, perhaps) or to avoid things that they dislike (such as the taste of a lemon wedge).

A major development of significance for later thinking and learning appears in the second year: the ability to make mental images, or internal mental representations, of objects. With the power of **mental representation,** children can now form mental images of objects and events and begin to use them in thinking and problem solving.

Gradually, the child takes mental representation one step farther by realizing that objects continue to exist even when they are out of sight. This ability, called **object permanence,** liberates the child from the present and from his or her immediate surroundings. (This makes the game of peekaboo interesting to a young child.) The basics are in place by one year of age, but the ability for object permanence continues to develop through the second year (Flavell, 1985). At the same time, language begins to appear, and so words become another way to make mental representations. Together these forms of representational thought become the major accomplishment of the sensorimotor stage.

■ **Sensorimotor stage** The first stage in Piaget's theory, during which the child relies heavily on innate motor responses to stimuli.
■ **Mental representation** The ability to form internal images of objects and events.
■ **Object permanence** The knowledge that objects exist independently of one's own actions or awareness.
■ **Preoperational stage** The second stage in Piaget's theory, marked by well-developed mental representation and the use of language.
■ **Egocentrism** In Piaget's theory, the self-centered inability to realize that there are other viewpoints beside one's own.

The Preoperational Stage (from about 2 to 6 or 7 Years of Age) The cognitive advances in the next developmental stage, the **preoperational stage,** grow out of the ability to represent objects mentally. One of these advances involves the emerging sense of self as distinctive from other people and objects in the environment. Another advance involves the ability to solve simple problems using mental representation (such as searching different places for a lost toy). Yet despite these abilities, the child cannot solve problems requiring logical thought. Other important limiting features of the child's mind in this period are *egocentrism, animistic thinking, centration,* and *irreversibility.*

- **Egocentrism,** a self-centered focus, causes children to see the world only in terms of themselves and their own position. Further, they assume that others see the world in the same way they do. So, when you are talking to a

preoperational child on the phone, she may say, "Look at my new dollie!" assuming you can see things on her end of the line. As a result of this egocentrism, preoperational children are not yet able to fully empathize with others or take others' points of view. For this reason, children may act in ways that have destructive or hurtful consequences, even though they don't intend to upset or harm others. Egocentrism also makes it difficult for a child at this stage to share toys or food.

- **Animistic thinking** involves the belief that inanimate objects have life and mental processes, just as people do. For example, if a child slips and bangs her head on the table, she might complain about the "bad table," blaming it for hurting her.
- **Centration** involves the inability to understand an event because the child focuses attention too narrowly, while ignoring other important information. That is, the child can "center" on only one bit of information at a time. So, for example, a thirsty child may insist on drinking a "big glass" of juice, preferring a tall narrow container to a short wide one, mistakenly assuming that the height of the glass ensures that it will hold more juice, while ignoring the other relevant dimension of width. (See the "Do It Yourself!" box "Playing with Children—Piagetian Style.")
- **Irreversibility** is the inability to think through a series of events or the steps involved in solving a problem and then to reverse course, returning to the mental starting point. In short, preoperational children lack the ability to do and then undo an act in their minds. To give a concrete example, Sam might see Mary spill a box of raisins on the table and think, "Wow! Mary has lots more raisins than I have in my little box." But preoperational Sam cannot mentally reverse the process and think, "If she put them all back in the box, it would look like the same amount I have in mine." This inability—to do a mental "experiment," then undo it and mentally try another approach—represents the biggest obstacle to logical thinking in the preoperational child.

While we might see these as limitations, keep in mind that they are also the characteristics that make children at this stage most charming and interesting—and different from older children and adults.

This 5-year-old girl is aware that the two containers have the same amount of colored liquid. However, when the liquid from one is poured into a taller narrow container, she indicates that there is more liquid in the taller one. She has not yet grasped the concept of conservation, which she will understand by age 6 or 7.

The Concrete Operational Stage (from about 7 to about 11 Years of Age) At the next stage, children break through the barrier of *irreversibility* to understand, for the first time, that many things may stay essentially the same, even when their superficial appearance changes. In this **concrete operational stage,** they can understand that a short, wide glass can hold as much juice as a tall, narrow one or that the spilled raisins must fit back in the box. So the problems that defeated the preoperational child now yield to a new understanding of the way that volume is *conserved.* Similarly, they now understand that a string of red beads is not longer than an identical string of blue beads, even though the red beads are stretched out in a line while the blue beads lie in a small pile. They realize that the beads *look* different in their grouping, but this does not mean that they *are* different in number. This new ability, called **conservation,** represents one of the most important cognitive breakthroughs that most 7-year-olds have made.

Along with the new ability to understand conservation, children at this stage acquire the capability for performing **mental operations.** They have overcome the problem of irreversibility, so they now can solve problems by manipulating concepts entirely in their minds. This allows the concrete operational child to think things through before taking action. As a result, they may be less impulsive. They are also less gullible, giving up many "magical" notions, such as the belief in Santa Claus, that they now know to be impossible.

- **Animistic thinking** A preoperational mode of thought in which inanimate objects are imagined to have life and mental processes.
- **Centration** A preoperational thought pattern involving the inability to take into account more than one factor at a time.
- **Irreversibility** The inability, in the preoperational child, to think through a series of events or mental operations and then mentally reverse the steps.
- **Concrete operational stage** The third of Piaget's stages, when a child understands conservation but still is incapable of abstract thought.
- **Conservation** The understanding that the physical properties of an object or substance do not change when appearances change but nothing is added or taken away.
- **Mental operations** Solving problems by manipulating images in one's mind.

DO IT YOURSELF! Playing with Children—Piagetian Style

If you have access to a child, you can try out some of the problems Piaget posed for his children in order to study their thinking. For example, with a preoperational or concrete operational child, it's always fun to give a conservation problem that involves pouring liquid from a tall, narrow container into a short, wide one. Begin by pouring the same amounts into two identical vessels, such as glass measuring cups. Get the child to agree that you are starting with the same amount in each. Then pour the liquid from one vessel into a shallow pan. Ask the child, "Does one of these have more than the other, or are they both the same?" Then see if your child's responses fit with Piaget's observations.

Piaget found that the concrete operational child—who understands conservation—will know that the volume of liquid remains the same, regardless of the shape of the container. The preoperational child will think that the shallow pan has less because the liquid does not come up as far on the container. This shows that the younger child does not know that volume is conserved, regardless of the shape of the container. Piaget claimed that it also showed that the younger child cannot reason about both height and width simultaneously.

Using their ability for performing mental operations, concrete operational children begin to use simple reasoning to solve problems. The symbols they use in reasoning are, however, still mainly symbols for concrete objects and events, not abstractions. The limitations of their concrete thinking are shown in the familiar game of "20 questions," the goal of which is to determine the identity of an object by asking the fewest possible yes/no questions of the person who thinks up the object. A child of 7 or 8 usually sticks to very specific questions ("Is it a bird?" "Is it a cat?"), but does not ask the higher-level questions that more efficiently narrow down the possibilities for the correct answer ("Does it fly?" "Does it have fur?").

The *formal operational stage,* Piaget's final stage of cognitive development, we will save for our discussion of adolescence, when the individual overcomes the limitations of the previous stages, undergoing yet another cognitive revolution. Suffice it to say for now that this final stage involves the development of abstract thought.

Beyond Piaget: Other Perspectives on Cognitive Development Most psychologists accept the broad picture that Piaget painted of development (Beilin, 1992; Flavell, 1996; Lourenço & Machado, 1996). However, newer research suggests that the transition between one stage and another is less abrupt—more continuous—than Piaget's theory implies. Also, researchers have shown that children are, in some ways, more intellectually sophisticated at each stage than Piaget had found (Munakata et al., 1997). Studies show, for example, that some mental representation occurs as early as three months of age, rather than in the second year, as Piaget had thought (Gulya et al., 1998). Recent research also shows that by one year of age, infants develop the complex idea that people have intentions that may differ from their own (Baldwin, 2000; Tomasello, 2000).

Some psychologists believe that what Piaget saw as limitations on preoperational thought may actually be the inability to *express* thoughts (Bauer, 2002). Thus preoperational children may actually *understand* some of the same concepts that older children do, but they may still lack the skills to perform accordingly. For example, a 5-year-old child who has watched her father prepare breakfast in the past can watch him and understand what he is cooking but may not be able to describe it to her visiting grandmother or express why she likes her pancakes "the way Daddy fixes them." Researchers have found, in contrast with Piaget's notion of centration, that young children (ages 3 and 4) understand that the "insides" of objects, although they are invisible, are not necessarily identical to their external appearances (Gelman & Wellman, 1991). And, in contrast with Piaget's claims about animistic thinking, 3- to 5-year-old

children, when pressed to do so, are consistently able to distinguish between real and purely mental (imaginary) entities (Wellman & Estes, 1986). Finally, studies of emotional development have shown that preoperational children can understand that other people have internal emotional responses that do not always jibe with their outward expressions (Bower, 1997b).

Other developmental psychologists counter that Piaget's theory is not as rigid as its critics claim. Rather, it is flexible enough to accommodate new findings. And, say Piaget's supporters, it underwent continual change throughout his long career (Lourenço & Machado, 1996).

What is really needed, says Robert Siegler, is a new metaphor for development (Siegler, 1994). Instead of the abrupt changes implied by stage theories, he proposes that we think of "waves." The wave metaphor, he says, better fits both the scientific data and our everyday experience, which shows the variability of children's behavior. For example, a child may, during a single day, use several different strategies to solve the same linguistic problem: "I ate," "I eated," and "I ated." This is not the pattern we would find if a child were making a sudden leap from one stage to another. Instead, says Siegler, this is a pattern of overlapping developmental waves, where each wave can be thought of as the ebb and flow in the strength of a cognitive strategy (Azar, 1995).

Social and Emotional Development

Our health, happiness, and even our survival depend on forming meaningful, effective relationships, in the family, with peers—and, later in life, on the job. This means that children need to begin the long process of learning the rules their society uses for governing its members' social and political interactions. They must also learn to monitor their own feelings and behavior and understand those of others.

As we have seen, Piaget taught that the preoperational child assumes other people share his or her view of the world. To grow beyond this egocentric perspective, the child must develop a **theory of mind.** This consists of an awareness that others may have beliefs, desires, and emotions different from one's own and that these mental states underlie their behavior (Frith & Frith, 1999). The theory of mind is also a set of expectations about how people will act in certain situations—such as when given a present or when spoken to angrily. This accomplishment is fundamental to successful social interaction, whether it be play, work, or establishing friendships and partnerships.

Smiling is one simple but important way people begin social and emotional interactions. So essential is a smile to human communication that a baby's first smile is probably generated automatically by genetically controlled processes. In fact, smiles occur in babies throughout the world (Gazzaniga, 1998a). The delight parents take in a baby's first smile represents the beginning of lifelong lessons in social behavior. People smile not only as a sign of positive feelings but also because their audience expects such a facial expression (Fridlund, 1990). However, social and emotional development involves much more than a winning smile. On the "nature" side, psychologists have found that an innate disposition or *temperament* influences our responsiveness to others. And on the "nurture" side, psychologists have found many environmental factors that influence socialization. We will analyze these two important concepts more deeply.

Temperament Psychologists use the term **temperament** for an individual's inherited, "wired-in" pattern of personality and behavior. Harvard researcher Jerome Kagan, who has studied temperament in thousands of children, observed that about 10 to 15% of infants are "born shy" or "born bold" (Kagan,

■ **Theory of mind** An awareness that other people's behavior may be influenced by beliefs, desires, and emotions that differ from one's own.

■ **Temperament** An individual's characteristic manner of behavior or reaction—assumed to have a strong genetic basis.

1994a, b; Kagan et al., 1986; Kagan & Snidman, 1991). In response to physical and social stimulation, shy babies are more easily frightened and less socially responsive than bold babies. Because of a baby's temperament, people are less likely to interact and be playful with the shy baby, accentuating the child's initial disposition.

Although basic temperaments can be recognized almost at birth, they are not written in stone (Kagan, 1996). (Remember: Nature always interacts with nurture.) Experience and parenting styles can modify the way temperament expresses itself. For example, a bold child reared by bold parents will certainly experience and respond to the world differently from a bold child reared by timid or fearful parents. Likewise, if a shy baby's parents recognize the child's withdrawal and gently play with her and encourage her to interact, the child may become more outgoing than her temperament would otherwise have predicted. Thus family members and friends can teach every individual a variety of responses to the world, all within his or her temperamental range. Nor is one temperament ideal for all situations. We should "remember that in a complex society like ours, each temperamental type can find its adaptive niche" (Kagan, quoted in Gallagher, 1994, p. 47).

Related to this are the ideas of Lev Vygotsky, who described a theory of social-cognitive development. Vygotsky maintained that social interaction plays a basic and key role in the development of cognition. In addition to the role of a supportive environment, he said, children have a **zone of proximal development** (Vygotsky, 1978) in which they may develop at either end of the zone (quickly or slowly), depending on the support and guidance available.

Socialization To help children find the most adaptive niches for their abilities and temperaments, parents socialize their offspring. *Socialization,* however, doesn't just happen it childhood. It is the lifelong process of shaping an individual's behavior patterns, values, standards, skills, attitudes, and motives to conform to those regarded as desirable in a particular society (Hetherington & Parke, 1975). We first learn about these things, of course, from our parents, so developmental psychologists have looked at the effects of various *parenting styles* on children's personalities and social behaviors. Aside from parents, many individuals and institutions exert pressure on the child to adopt socially approved values. Among these, the school and leisure-time influences, such as television and peers, have tremendous impact. And increasingly, many preschool children are shaped by their experiences in day care. Let's first take a look at parenting styles.

Four Parenting Styles and Their Effects Most approaches to child rearing fall into one of four distinct parenting styles that developmental psychologists have found in families all over the world (Baumrind, 1967, 1971; Darling & Steinberg, 1993; Russell et al., 2002). (As you read about these, you might try to imagine how you would have turned out differently if your parents had used one of the other approaches.) *Authoritarian parents* often live by the slogan "Spare the rod and spoil the child." They demand conformity and obedience, and they tolerate little discussion of rules, which they enforce with punishment or threats of punishment. In an alternative approach, *authoritative parents* can be demanding, too. They have high expectations of their children, which they enforce with consequences. But unlike authoritarian parents, they combine high standards with warmth and respect for the child's views: They are quite willing to listen to a child's ideas and feelings, and they often encourage a democratic family atmosphere. Authoritative parents usually place a heavy emphasis on reasoning and explaining in order to help their children learn to anticipate the consequences of their behavior. Taking a third approach, *permissive parents* set few rules and allow the children to make their own deci-

■ **Zone of proximal development**
The difference between what a child can do with help and what the child can do without any help or guidance.

TABLE 9.1 Features of the Four Parenting Styles

Style	Emotional involvement	Authority	Autonomy
Authoritative	Parent is warm, attentive, and sensitive to child's needs and interests.	Parent makes reasonable demands for the child's maturity level; explains and enforces rules.	Parent permits child to make decisions in accord with developmental readiness; listens to child's viewpoint.
Authoritarian	Parent is cold and rejecting; frequently degrades the child.	Parent is highly demanding; may use coercion by yelling, commanding, criticizing, and reliance on punishment.	Parent makes most decisions for the child; rarely listens to child's viewpoint.
Permissive	Parent is warm but may spoil the child.	Parent makes few or no demands–often out of misplaced concern for child's self-esteem.	Parent permits child to make decisions before the child is ready.
Uninvolved	Parent is emotionally detached, withdrawn, and inattentive.	Parent makes few or no demands–often lacking in interest or expectations for the child.	Parent is indifferent to child's decisions and point of view.

sions. Like authoritative parents, they are caring and communicative, but permissive parents give most decision-making responsibility to their children. Permissive parents believe that children can learn better from the consequences of their own actions than they can from following rules set by their parents. *Uninvolved parents* tend to be either indifferent or rejecting, sometimes to the point of neglect or abuse (Maccoby & Martin, 1983). Typically parents in this group lead such stress-filled lives that they have little time or energy for their children. (See Table 9.1.)

You can probably guess the usual outcomes of these different parenting styles. Research shows that children with authoritative parents tend to be confident, self-reliant, and enthusiastic—overall, happier, less troublesome, and more successful. Those with authoritarian parents tended to be anxious and insecure. Those with permissive or uninvolved parents are typically less mature, more impulsive, more dependent, and more demanding. Thinking back to our earlier discussion of attachment, these findings shouldn't be surprising. Generally speaking, authoritative parents take a more involved, interactive role in their children's lives—forming a stronger social-emotional attachment—than do the other three types of parents. This lays a strong foundation for prosocial behavior in the developing child.

Effects of Day Care As working parents make increasing use of day care for their children, we should ask the following question: How necessary is it to have a full-time caregiver? The question is an urgent one in the United States and Canada, where over half of all mothers with children under age 3 are employed, and more children are cared for by paid providers than by relatives (Scarr, 1997, 1998; Statistics Canada, 2002; U.S. Bureau of the Census, 2002).

The research on this issue sends mixed messages. First the good news: Most children thrive in day care. They do as well—sometimes better—both intellectually and socially as children raised at home by a full-time parent. Now the bad news: Some poor-quality day care experiences influence children to be aggressive, depressed, or otherwise maladjusted. Fortunately, the overwhelming majority of day care centers do a fine job (Bower, 1996; Clarke-Stewart, 1989; NICHD Early Child Care Research Network, 2003).

Given how important day care is in our society, it is comforting to note that having alternative caregivers does not in itself cause psychological problems. Rather, difficulties appear most often in poorly staffed centers where large numbers of children get little attention from only a few adults (Howes et al., 1988; NICHD Early Child Care Research Network, 2000). Another source of difficulty results from the unfortunate fact that children who are placed in the poorest-quality day care programs are most often from the poorest, most disorganized, and most highly stressed families. Developmental psychologist Laura Berk (2004) concludes that this volatile combination of inadequate day care and family pressure places some children at high risk for emotional and behavioral problems. Yet, she says, using this evidence to curtail day care services would be a mistake, because forcing a parent on a marginal income to stay home may expose children to an even greater level of risk.

All this means that day care is, in itself, neither good nor bad. It is the quality of care, whether given by a parent or a paid provider, that makes all the difference. Development expert Sandra Scarr (1998) says,

> There is an extraordinary international consensus among child-care researchers and practitioners about what quality child care is: It is warm, supportive interactions with adults in a safe, healthy, and stimulating environment, where early education and trusting relationships combine to support individual children's physical, emotional, social, and intellectual development. . . . (p. 102)

School and Leisure Influences Children and adolescents in the United States and other industrialized countries have much more free time than children elsewhere in the world. In nonindustrialized societies, children average some six hours a day working at some sort of chores or labor. By comparison, the typical American child spends less than one-half hour at such tasks. Moreover, the amount of free time available to U.S. children has increased dramatically over the last several generations (Larson, 2001). While long, hard work may teach discipline and responsibility, there is little evidence that it produces positive changes in cognitive development.

Children and adolescents in industrialized societies average about six hours a day of discretionary time. Many choose to spend this time in organized activities, such as sports, although the most popular pursuit is "hanging out" with friends.

On the other hand, American children also spend more time (on the average) doing schoolwork than did children in years past—although not as much as their foreign counterparts in other industrialized countries. Still, there is time left over: How is it spent? Much is taken up watching television, talking on the telephone, or surfing the Internet (the consequences of which are largely unknown at present). The largest amount of discretionary time, however, is spent "hanging out" with friends. Surprisingly, however, many children spend the majority of their "free" time in structured activities, such as clubs and other organizations, art and music lessons, and sports—although this varies greatly from child to child (Larson, 2000).

Is the time of our nation's children well spent? Certainly some of it is unproductive or even counterproductive. For example, spending a great deal of time watching violent TV is predictive of aggressive behavior (Strasburger, 1995). Still, only the most unfeeling person would argue that all a child's time should be accounted for in developmentally productive activities. Clearly, the increase in leisure time, as well as increased access to information and the media, is a trend that is sweeping over industrialized nations. Where it may lead will be a subject for future research.

Gender Differences in Socialization Anyone who has watched young boys and girls playing has noticed gender differences in their social interaction. The sexes usually prefer to segregate themselves—a pattern that holds across cultures (Maccoby, 1998, 2000). In their play, boys are typically more aggressive than girls, although there are certainly exceptions. Girls tend to organize themselves into small, cooperative groups. By contrast, boys often form larger groups that have a hierarchical structure, or "pecking order." In these groups, individual boys continually compete for higher-ranking positions. They frequently resort to aggressive tactics, such as hitting, shoving, and verbal threats. Evolutionary psychologists believe that these gender differences have an innate basis (Buss, 1999), which may be related, in part, to gender differences in testosterone levels (Dabbs, 2000). This does not mean, of course, that environmental factors, such as parenting styles and peer influences, make no difference. Social-cognitive theorists like Kay Bussey and Albert Bandura (1999) attempt to counter this view by reminding us that children also *learn* gender roles and gender-related behaviors, such as aggressiveness, competitiveness, or cooperation.

PSYCHOLOGY IN YOUR LIFE: CHILDHOOD INFLUENCES ON YOUR PERSONALITY

Your personality and your social relationships are a unique blend of your temperament, your attachment style, and many other forces that have acted on you through life. But are there common problems that everyone faces at certain points in life—problems that generate predictable personality changes across the lifespan? A theory of personality proposed by psychoanalyst Erik Erikson says yes.

As a middle-aged immigrant to America, Erik Erikson (1963) became aware of conflicts and choices he faced because of his new status. This caused him to reflect on the many such conflicts every individual must face in the continuing process of development. Before reading further, please take a moment to do as Erikson did: Recall some of the conflicts or challenges you have experienced in childhood. These will give you a vantage point from which to understand Erikson's theory—and your own personality.

Erikson's Theory of Psychosocial Development Erikson saw human development as a sequence of **psychosocial stages,** defined by common problems that emerge throughout life, from infancy to old age. As the term implies, all involve our social relationships. When people face these challenges, he said, they make choices that influence the growth of their personalities. Good choices lay the foundation for healthy growth during later stages.

Erikson identified eight such stages. With each succeeding stage, a new challenge comes into focus, as shown in Table 9.2. The problem must be satisfactorily resolved at a given stage if an individual is to cope successfully with the new problems that present themselves in later stages. Here we will review the psychosocial stages of childhood; later in the chapter we will review the issues experienced in adolescence and adulthood.

Trust versus Mistrust In the first stage of psychosocial development, you needed to develop a basic sense of trust in your environment and in those who cared for you. This trust is a natural accompaniment to a strong attachment relationship with a caregiver who provides food, warmth, and the comfort of physical closeness. But if these basic needs were not met, Erikson suggested, you experienced a developmental crisis that he called *trust versus mistrust.* At this stage, inconsistent parenting, lack of physical closeness and warmth, or the frequent absence of a caring adult may produce a lasting sense

■ **Psychosocial stages** In Erikson's theory, the developmental stages refer to eight major challenges that appear successively across the lifespan, which require an individual to rethink his or her goals and relationships with others.

TABLE 9.2 Erikson's Psychosocial Stages

Age/Period (approximate)	Principal Challenge	Adequate Resolution	Inadequate Resolution
0 to 1½ years	Trust vs. mistrust	Basic sense of safety, security; ability to rely on forces outside oneself	Insecurity, anxiety
1½ to 3 years	Autonomy vs. self-doubt	Perception of self as agent; capable of controlling one's own body and making things happen	Feelings of inadequacy about self-control, control of events
3 to 6 years	Initiative vs. guilt	Confidence in oneself as being able to initiate, create	Feeling of lack of self-worth
6 years to puberty	Competence vs. inferiority	Adequacy in basic social and intellectual skills; acceptance by peers	Lack of self-confidence; feelings of failure
Adolescence	Identity vs. role confusion	Comfortable sense of self as a person, both unique and socially accepted	Sense of self as fragmented, shifting, unclear sense of self
Early adulthood	Intimacy vs. isolation	Capacity for closeness and commitment to another	Feeling of aloneness, loneliness, separation; denial of intimacy needs
Middle adulthood	Generativity vs. stagnation	Focus of concern beyond oneself, to family, society, future generations	Self-indulgent concerns; lack of future orientation
Late adulthood	Ego-integrity vs. despair	Sense of wholeness; basic satisfaction with life	Feelings of futility, disappointment

of mistrust, insecurity, and anxiety. Children facing such conditions will not be prepared for the second stage in their psychological development. The healthy personality requires a foundation of trust from which the individual can become more adventurous.

Autonomy versus Self-Doubt In the second stage, as you acquired skills in walking and talking, you also expanded your ability to interact with objects and people. If you entered this stage with a sense of trust in others, these new abilities should have brought you a comfortable sense of autonomy (independence) and of being a capable and worthy person. Too much restriction or criticism at this stage may have led to self-doubts—hence the term for this stage: *autonomy versus self-doubt.* Harsh demands made on you beyond your ability—such as attempting toilet training too early—could have discouraged your efforts to persevere in mastering new tasks. Such demands also can lead to stormy scenes of confrontation, disrupting the supportive parent–child relationship. In contrast, the 2-year-old who insists on the right to do something without help, in response to appropriate demands, acts out of a need to affirm his or her autonomy and adequacy.

Initiative versus Guilt If you developed a basic sense of trust and autonomy during your preschool days, you probably entered the grade school years as a child who could comfortably initiate intellectual and motor tasks. For example, children in this stage want to do things for themselves, such as choose what to wear or what to eat. The danger at this stage comes from overcontrolling adults, who demand an impossible degree of self-control ("Why can't you sit still?"), with the result that the child is overcome by feelings of inadequacy and guilt. The term for this stage reflects these two alternatives:

initiative versus guilt. Caregivers' responses to self-initiated activities either encourage or discourage the freedom and self-confidence needed for the next stage.

Competence versus Inferiority If you successfully resolved the crises of the three earlier stages, you were ready to develop your skills and competencies in a more systematic way. During the elementary school years, school activities and sports offer arenas for learning more complex intellectual and motor skills, while peer interaction offers the chance to develop social skills. Successful efforts in these pursuits lead to feelings of competence. Some youngsters, however, become discouraged spectators rather than performers, or they experience failure that leaves them with a sense of inferiority. The term for this stage, therefore, is *competence versus inferiority.*

A Critical Reflection on Erikson's Theory How much confidence should we place in Erikson? Although widely respected, his developmental theory does have some shortcomings. Based mainly on clinical observation, it lacks a rigorous scientific basis. Moreover, as some critics point out, Erikson's list of developmental issues does not adequately capture the problems faced by girls and women. Nonetheless, your authors suggest that Erikson's work should be seen as a comprehensive pioneering effort that has encouraged us to look at the life cycle as a whole, putting into perspective both the unfolding changes and the continuity of life experience.

CONNECTION: CHAPTER 2
Clinical observation is a form of the *case study* method.

CHECK YOUR UNDERSTANDING

1. **RECALL:** Match the ability/limitation with the Piagetian stage at which it becomes an important characteristic of thinking.
   - **a.** centration
   - **b.** abstract thought
   - **c.** innate schemas
   - **d.** conservation
   - **i.** sensorimotor stage
   - **ii.** preoperational stage
   - **iii.** concrete operational stage
   - **iv.** formal operational stage
2. **APPLICATION:** Imagine that you are a family counselor. Which parenting style would you encourage parents to adopt in order to encourage their children to become confident and self-reliant?
   - **a.** authoritative
   - **b.** authoritarian
   - **c.** permissive
   - **d.** uninvolved
   - **e.** both a and b
3. **UNDERSTANDING THE CORE CONCEPT:** There are many developmental tasks that children must face in the areas of thought and social interaction. Can you name one in each of these areas?

ANSWERS: 1. a. **ii,** b. **iv,** c. **i,** d. **iii** 2. **a** 3. Thought processes: for example, young children are not capable of abstract reasoning. (Piaget's theory suggests other differences at each stage.) Social relationships: attachment, development of a theory of mind.

WHAT CHANGES MARK THE TRANSITION OF ADOLESCENCE?

KEY QUESTION

Most early theorists assumed that the major work of development occurred before adolescence. After that, they assumed, the psyche was set for life and would undergo few important changes. Modern research disputes these older views. Modern psychologists agree that we have a remarkable capacity for developmental change throughout our lifespan (Kagan, 1996, 1998). Again in adolescence the big changes lie in three important areas—as our Core Concept says:

CORE CONCEPT

Adolescence offers new developmental challenges growing out of physical changes, cognitive changes, and socioemotional pressures.

Just when does *adolescence* begin? Or, to put the question more personally, what event first made you think of yourself as an adolescent? Chances are that it had something to do with your sexual maturation, such as a first menstrual period or a nocturnal ejaculation. Psychologists mark the beginning of **adolescence** as the onset of *puberty,* when sexual maturity, or the ability to reproduce, is attained. However, they cannot so precisely identify the point at which adolescence ends and adulthood begins.

Adolescence and Culture

Variations among cultures compound the difficulty of specifying the span of adolescence. Although the physical changes that take place at this stage are universal, the social and psychological dimensions of adolescence depend on the cultural context. For example, if you enter your teen years in a society that celebrates puberty as the entry to adulthood and rewards you with the power to make responsible choices, you will have a very different experience from someone whose culture condemns teenagers as confused and potentially dangerous troublemakers.

In fact, most nonindustrial societies do not identify an adolescent stage as we know it. Instead, children in these societies move directly into adulthood with **rites of passage.** These rituals usually take place at about the time of puberty and serve as a public acknowledgment of the transition from childhood to adulthood. Rites of passage vary widely among cultures, from extremely painful rituals to periods of instruction in sexual and cultural practices or periods of seclusion involving survival ordeals. For example, in some tribal groups, the young person may be asked to take a meditative journey alone or to submit to symbolic scarring or circumcision surrounded by friends and family. Once individuals have completed the passage, there is no ambiguity about their status: They are adults, and the ties to their childhood have been severed.

Our own society has few transition rituals to help children clearly mark their new adolescent status or for adolescents to know when they have become young adults. One such rite of passage for many middle-class teenagers in America is qualifying for a driver's license. Another is high school graduation. Both provide a young person with an added measure of freedom and independence that is not available to children.

Although many issues are important in adolescence, we will focus on a few of the most important developmental tasks that confront adolescents in the United States and the industrialized Western world: coming to terms with physical maturity, a new level of cognitive development, redefining social roles and emotional issues, dealing with sexual opportunities and pressures, and the development of moral standards. Each of these issues is just one component of the central task of establishing one's identity. We begin with the physical changes that mark the end of childhood and the onset of adolescence.

■ **Adolescence** In industrial societies, a developmental period beginning at puberty and ending (less clearly) at adulthood.

■ **Rites of passage** Social rituals that mark the transition between developmental stages, especially between childhood and adulthood.

■ **Puberty** The onset of sexual maturity.

■ **Primary sex characteristics** The sex organs and genitals.

■ **Secondary sex characteristics** Gender-related physical features that develop during puberty, including facial hair and deepening voice in males, widened hips and enlarged breasts in females, and the development of pubic hair in both sexes.

Physical Maturation in Adolescence

One of the first signs of approaching adolescence is the *pubescent growth spurt.* Two to three years after the onset of the growth spurt, **puberty,** or sexual maturity, is reached. Puberty for males begins with the production of live sperm (usually at about age 14 in the United States), while for girls it begins at *menarche,* the onset of menstruation (usually between ages 11 and 15). These serve as indicators that the **primary sex characteristics**—the sex organs and genitals—are undergoing dramatic change, accompanied by equally dramatic changes in the **secondary sex characteristics,** the enlargement of breasts and

the widening of hips in girls, the deepening of the voice and appearance of facial hair in boys, and the sprouting of pubic hair in both sexes.

Simultaneously, boys and girl generally become more aware of their own appearance, often judging themselves harshly by the standards they think other people may be applying to them. And, unfair as it may be, physical attractiveness does influence the way people think about each other (Hatfield & Rapson, 1993). Thus, one of the most formidable tasks of adolescence involves coming to terms with one's physical self by developing a realistic yet accepting *body image* (one's personal and subjective view of one's own appearance). This image is dependent not only on measurable features, such as height and weight, but also on perceptions of other people's assessments and on cultural standards of physical beauty. During adolescence, dramatic physical changes and heightened emphasis on peer acceptance (especially acceptance by sexually attractive peers) intensifies concern with one's body image.

Approximately 44% of American adolescent girls and 23% of boys claimed that they have "frequently felt ugly and unattractive"; similar data have been found across many cultures (Offer et al., 1981, 1988). Physical appearance is clearly one of the biggest concerns among adolescents (Perkins & Lerner, 1995). Girls' self-concepts are particularly tied to perceptions of their physical attractiveness, while boys seem more concerned with their physical prowess, athletic ability, and effectiveness in achieving goals (Lerner et al., 1976; Wade, 1991). In general, girls and women are more dissatisfied with their weight and shape than are males, and they experience more conflict about food and eating (Rolls et al., 1991). These differences probably mirror a cultural preoccupation with female beauty and male strength—an inevitable source of concern because not all adolescents can embody the cultural ideals of attractiveness. There are also cultural influences on self-concept; some research indicates that the self-esteem of white adolescents of both sexes is more tied to physical attractiveness than is that of black adolescents (Wade, 1991). Over time, adolescents seem to become more accepting of their appearances. Nonetheless, the attainment of acceptable body images can be a difficult task.

● Body image becomes especially important in the teenage years.

Cognitive Development in Adolescence

Adolescence brings with it Piaget's final stage of cognitive growth, involving the capacity for abstract and complex thought. In this **formal operational stage,** the individual begins to ponder introspective problems involving ways of becoming better accepted by peers, along with abstract and intangible issues, such as fairness, love, and reasons for existence. With these formal operational reasoning powers, adolescents and adults now approach life's problems in a way that demonstrates their ability to use abstractions and to adopt thinking strategies that are not merely random guesswork. In the "20 questions" game we mentioned earlier, they impose their own structures on the task, starting with broad categories and then formulating and testing hypotheses in light of their knowledge of categories and relationships. Their questioning moves from general categories ("Is it an animal?") to subcategories ("Does it fly?") and then to specific guesses ("Is it a bird?") (Bruner et al., 1966).

Behind these changes in thinking are some profound changes occurring inside the body. Concentrations of the hormones estrogen and testosterone rise to high levels. At the same time, the frontal lobes of the brain, a region involved in social and emotional behaviors, is undergoing a "remodel," involving growth of new circuits, loss of some old ones, and changes in the balance of neurotransmitters (Spear, 2000). All of this probably contributes to increases among adolescents in sensation-seeking and risk-taking behaviors, as well as to increasing preoccupation with body image, sex, and social-emotional issues.

■ **Formal operational stage** The last of Piaget's stages, during which abstract thought appears.

According to Erikson, during the "identity crisis" adolescents must define their identities as individuals even as they seek the comfort and feeling of belonging that comes from being with friends and family. One compromise might be to experiment with different norms–such as clothing or hairstyles–within the security of supportive relationships with companions, cliques, or romantic partners.

Social and Emotional Issues in Adolescence

Erik Erikson asserted that the essential problem of adolescence is discovering one's true identity amid the confusion of playing many different roles for different audiences in an expanding social world. Resolving this problem of identity helps the individual develop a sense of a coherent self. While it is normal and healthy for one's identity to change throughout life, failure of the adolescent to find a satisfactory resolution for his or her identity issues may result in a self-concept that lacks a stable core. Resolution of this issue is both a personal process and a social experience (Erikson, 1963).

The Increasing Influence of Peers Several factors influence the move toward an emerging self-identity. Family ties become stretched as the adolescent spends more time outside the home (Paikoff & Brooks-Gunn, 1991). In industrialized countries such as the United States, much of that time is spent in school. What adolescents do with that time, however, depends on gender (Buhrmester, 1996). Friendships among girls are built on emotional closeness, with girls often getting together "just to talk." By contrast, friendships among boys emphasize activities, with talk centering on personal achievements or those of others.

Some developmental experts argue that the effects of parents, family, and childhood become nearly lost as the adolescent peer group gains influence (Harris, 1995). In American society, the adolescent encounters new values, receives less structure and adult guidance, and feels a strong need for peer acceptance. As a result, adolescents report spending more than four times as much time talking to peers as to adults (Csikszentmihalyi et al., 1977; Larson, 2001). With their peers, adolescents refine their social skills and try out different social behaviors. Gradually, they define their social identities, the kind of people they choose to be, and the sorts of relationships they will pursue.

Is Adolescence a Period of Turmoil? Problems with loneliness, depression, and shyness can also become significant during adolescence, which is one reason for the sharp increase in suicide among teenagers (Berk, 2004; U.S. Bureau of the Census, 2002; Zimbardo, 1990). Studies of adolescent suicide show that the triggering experience for such a tragedy is often a shaming or humiliating event, such as failure in some achievement or a romantic rejection (Garland & Zigler, 1993). The intensity of a young person's social and personal motives can make it hard to keep perspective and recognize that even difficult times will pass and that everyone makes mistakes.

Many parents worry that their teenagers will endanger themselves in proving their loyalty to unreasonable friends or norms. Fortunately, research suggests that most adolescents are able to "look before they leap" by considering the wisdom of committing risky acts (Berndt, 1992). Adolescents who have poor relationships with their parents are at greater risk for trouble.

Another factor also has a huge influence on adjustment: the biological changes associated with puberty—for which many teenagers are unprepared. Awakening interest in sexuality is amplified by the hormonal surges of adolescence. High levels of testosterone, particularly in boys, have been associated with risky and antisocial behavior. Again, however, relationships with parents are crucial: Testosterone-related problems are much more likely in teens who lack the stabilizing force of a solid relationship with their parents (Booth et al., 2003).

But is adolescence inevitably a period of turmoil? It is a period in which individuals are likely to have conflicts with their parents, experience extremes of mood, and engage in risky behaviors (Arnett, 1999). For some, adolescence certainly presents overwhelming problems in relationships and in self-esteem. As a survey of the research has concluded, "The adolescent years mark the

beginning of a downward spiral for some individuals" (Eccles et al., 1993, p. 90). Yet for most teens, these years are *not* a time of anxiety and despair (Myers & Diener, 1995). While many parents anticipate that the relationship with their children will encounter a rocky road when the children enter adolescence, the more typical experience is relatively tranquil. In fact, the majority of adolescent youth say that they feel close to their parents (Galambos, 1992). In general, those who have the least trouble are adolescents with authoritative parents—who are responsive and, at the same time, hold their children to high standards. Those adolescents who have the most difficulty are most likely to come from homes where parenting is either permissive or authoritarian (Collins et al., 2000).

Delinquency Only a small proportion of teens and young adults (about 6%) are at high risk for crime, and most of them are males in the 15- to 25-year age range (Lykken, 2001). Nevertheless, this small group accounts for about half of all crimes committed. What causes these individuals to turn to criminal behavior? There is no single, simple answer, but one of the important correlates has to do with family structure. Please realize that many other factors are undoubtedly also at work, including poverty, abuse, media influences, lack of job opportunities, and lack of education.

We focus here on family structure because it is the single strongest correlate of delinquency. Several studies have found that more than two-thirds of all delinquent males come from single-parent families—almost always involving a mother but no father (Beck et al., 1988; Forgatch et al., 1994; Snyder & Sickmund, 1995). A similar percentage of teenage girls who have babies out of wedlock also come from single-mother families (Kristol, 1994). The common thread seems to be fatherless, single-parent families.

We hasten to remind you that these data were not obtained by experiments. They are correlations. Obviously, then, they do not prove that fatherlessness *causes* delinquency. Yet, because we have no other obvious alternatives that connect so strongly with delinquency, fatherlessness remains a chief suspect. Further, the rise in delinquency over the last several decades parallels the increase in divorce and out-of-wedlock births during the same period (Lykken, 2001).

What can be done about delinquency? Few would go as far as psychologist David Lykken (2001), who has suggested—perhaps with tongue in cheek—licensing people to become parents. But when we think about the social forces that work against the family structure, many possibilities suggest themselves, including a welfare system and a tax system that have built-in disincentives for families, along with an educational system that too often does little to prepare students for dealing with the problems of family relationships. As you can see, this is an area ripe for both research and action.

Sexual Issues in Adolescence

A new awareness of sexual feelings and impulses accompanies physical maturity. In one large study, the majority of American adolescent males and females said that they often think about sex (Offer et al., 1981). Yet many still lack adequate knowledge or have misconceptions about sex and sexuality—even if they are sexually active. Sex is a topic parents find difficult to discuss with children, so adolescents tend to be secretive about sexual concerns, making exchange of information and communication even more difficult. The development of a sexual identity that defines sexual orientation and guides sexual behavior thus becomes an important task of adolescence.

Masturbation is the most common orgasmic expression of sexual impulses in adolescence (Wilson & Medora, 1990). By age 16, almost 90% of boys and 60% of girls in the United States report that they have masturbated (Janus &

Janus, 1993). But the figures we have could well be low. You can imagine the problems scientists face in trying to get good data on such private sexual practices. Sex research typically involves anonymous surveys, which may not give a complete picture of behaviors that are often associated with shame and guilt. Thus, one should realize that the statistics reported are estimates—often likely to be underestimates.

Same-Sex Orientation in Adolescence The same cautions that apply to the data on masturbation also apply to the research on adolescents who report they are gay, lesbian, or bisexual. Moreover, the data we have are somewhat sparse because funds for research on sexual behavior have been cut drastically in recent years. One study, however, involved data on some 83,000 youth in grades 7 through 12, obtained by combining information from several smaller surveys (Reis & Saewyc, 1999). Overall, the study found that same-sex sexual activity was reported by between 1% and 5.3% of the respondents.

Same-sex sexual behavior does not necessarily mean that the individual considers him- or herself to be homosexual or bisexual. Some experiment with same-sex activity yet think of themselves as heterosexual. For others, however, such experiences do fit with a gay, lesbian, or bisexual orientation—or with indecision about their orientation. Indeed, one sample from the study cited above found that 8.5% of the respondents identified themselves as gay, lesbian, bisexual, or undecided.

Exclusively homosexual feelings are difficult to resolve during adolescence, when individuals are intensely concerned with the conventions and norms of their society. While most gay and lesbian individuals first become aware of their sexual orientation in early adolescence, many may not attain self-acceptance of their sexual identities until their middle or late 20s (Newman & Muzzonigro, 1993). The time lag undoubtedly reflects the relative lack of social support for a homosexual orientation and exemplifies the importance of society's role in all aspects of identity development.

Heterosexual Behavior in Adolescence The overwhelming majority of adolescents have a predominantly heterosexual orientation. And do they practice their preferences? The proportion of American adolescents engaging in sexual intercourse rose substantially during the 1970s and 1980s but then leveled off (Chilman, 1983; London et al., 1989; Reinisch, 1990; Zeman, 1990). The 1990s, however, saw a drop in adolescent intercourse of about 10% (Centers for Disease Control, 2000). In a 1995 study, about half of all young Americans had engaged in intercourse by age 17, and about 75% had done so by the age of 20 (Harvey & Spigner, 1995).

There is evidence that the initial sexual experiences of males and females differ substantially. For the vast majority of females, emotional involvement is an important ingredient of sexual attraction. In contrast, for most males, personal relationships appear to be less important than the sex act itself. In fact, the average male reports little emotional involvement with his first sexual partner (Miller & Simon, 1980; Sprecher et al., 1995).

PSYCHOLOGY IN YOUR LIFE: THE DEVELOPMENT OF MORAL THINKING

Is there a pattern in the development of our sense of right and wrong? The best-known psychological approach to moral development comes from the late Lawrence Kohlberg (1964, 1981), who based his theory on Piaget's view

TABLE 9.3 Kohlberg's Stages of Moral Reasoning

Levels and Stages	Reasons for Moral Behavior
I. Preconventional morality	
Stage 1: Egocentric pleasure/pain/profit orientation	Avoid pain or avoid getting caught
Stage 2: Cost/benefit orientation; reciprocity ("I'll scratch your back if you'll scratch mine")	Achieve/receive rewards or mutual benefits
II. Conventional morality	
Stage 3: "Good child" orientation	Gain acceptance, avoid disapproval
Stage 4: Law-and-order orientation	Follow rules, avoid penalties
III. Postconventional (principled) morality	
Stage 5: Social contract orientation	Promote the welfare of one's society
Stage 6: Ethical principle orientation (e.g., Gandhi, Jesus, Mohammed)	Achieve justice, be consistent with one's principles, avoid self-condemnation

of cognitive development. After all, reasoned Kohlberg, moral thinking is just a special form of cognition. Mirroring Piaget's stages, each stage in Kohlberg's theory of moral reasoning is based on a different moral standard. Table 9.3 summarizes these stages.

It is important to understand that Kohlberg was more interested in the ways that people *think* about moral problems than in what they will *do* when led into temptation (Alper, 1985; Kohlberg, 1968). Accordingly, Kohlberg probed people's moral thinking by presenting people with a series of *moral dilemmas,* such as the following:

> In Europe a woman was near death from a very special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid $200 for the radium and charged $2000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and broke into the man's store to steal the drug for his wife. Should Heinz have done that? Why? (Colby et al., 1983, p. 77)

Think about your own response to this situation before you read further.

It is important to understand that it made no difference to Kohlberg whether a person said that Heinz should or should not have stolen the drug. The problem is a genuine dilemma, so a well-reasoned case can be made on either side. For Kohlberg and his colleagues, the interesting part of an individual's answer was the moral thinking behind it. They found that the reasons given fell into six categories, corresponding to the following stages. See if you can tell where your own response to the Heinz problem fits.

- *Stage 1:* People reasoning at this stage think only of reward and punishment. They show no concern for others. In response to the Heinz dilemma they might say, "He should take the drug because he might get in trouble if he let his wife die." Or, on the other hand, "He shouldn't steal the drug because he might get caught and go to jail."
- *Stage 2:* The first sign of awareness of other perspectives shows itself at the second stage of moral reasoning. Still concerned about reward and punishment, the stage 2 person may seek personal gain by appealing to another person's self-interest, saying, in effect: "You scratch my back, and I'll scratch yours." Here is a sample stage 2 response to the Heinz case: "He should steal the drug because he is poor and needs his wife to help him make a living."
- *Stage 3:* The main concerns at this stage are seeking social approval and keeping everyone happy. Decisions are based on personal relationships rather than on principle. A typical stage 3 response: "They won't blame him for stealing the drug, but everyone would think he is bad if he let his wife die."
- *Stage 4:* Maintaining social order is paramount at stage 4. In this stage people often emphasize laws, rules, policies, promises, duty, or respect for authority in their responses. Someone at stage 4 might say, "He shouldn't steal the drug because it would violate the Ten Commandments," or "He should steal the drug because his first obligation is to his wife."
- *Stage 5:* Kohlberg called this the "social contract" stage because it emphasized the idea that rules and laws are flexible and can be changed by social consensus and by legislation. Emphasis at this stage is on fairness, rather than on the blind obedience of the previous stage. A possible stage 5 response to the Heinz dilemma: "He should take the drug, and the law should be interpreted to allow an exception under such desperate circumstances."
- *Stage 6:* At this stage the individual bases a decision on universal principles of conscience that he or she would apply to all people in all situations. These are abstract and general principles, which often refer to the dignity and worth of each person, rather than concrete rules such as the Ten Commandments. A possible stage 6 response: "He should take the drug because if he doesn't, he is putting a greater value on property than on human life."

You can see how Kohlberg's stages of moral reasoning parallel the stages of Piaget's theory, as the individual moves from concrete, egocentric reasons to more other-oriented, abstract ideas of right and wrong. Accordingly, at the first stages, a child may not steal a cookie for fear of punishment, while at a more advanced level, the child may resist stealing for fear of not living up to the parents' expectations. In general, the earliest stages of moral reasoning are based on self-interest, while later, more advanced stages center on others' expectations or on broader standards of social good. Unfortunately, not all people attain the later, least egocentric stages. In fact, Kohlberg found that many adults never even reach stage 4.

Culture and Morality Does moral development follow the same developmental sequence everywhere? Yes, said Kohlberg. Cross-cultural work shows that individuals attain the same stages in the same order in all cultures studied, including Turkey, Taiwan, Guatemala, Japan, and the United States (Eckensberger, 1994). However, this research also hints at some limitations of the theory in explaining moral development in other cultural contexts: The higher

stages, as defined by Kohlberg, have not been found in all cultures. Even in his native United States, Kohlberg found that stages 5 and 6 do not always emerge. Their emergence appears to be associated with high levels of verbal ability and formal education (Rest & Thoma, 1976).

Gender and Morality One of the most stinging criticisms of Kohlberg's theory has come from Carol Gilligan (1982), a colleague at Kohlberg's own campus. Gilligan argued that the theory has a male bias and ignores uniquely feminine conceptions of morality. For women, says Gilligan, morality is embedded in social relationships and personal caring, which makes them appear to reach a plateau at stage 3. To his credit, Kohlberg responded by taking a fresh look at his data for stage 3 and stage 4. As a result, he redefined stage 4 by moving militant law-and-order responses (most often given by males) to stage 3. Most subsequent studies have found no significant sex differences in moral reasoning (Walker, 1989, 1991; Walker & de Vries, 1985; Walker et al., 1987).

A more telling critique suggests that research on moral reasoning may have limited practical value. Studies have found no close connection between people's moral reasoning and their behavior. Moreover, most moral reasoning comes after people have intuitively decided how to act. Moral reasoning, then, may be little more than rational justification for an emotional decision, claims psychologist Jonathan Haidt (2001). In the arena of morality, says Haidt, it's the "emotional dog" that wags its "rational tail," not the other way around.

CHECK YOUR UNDERSTANDING

1. **RECALL:** Which one of the following would be considered a secondary sex characteristic?
   - **a.** deepening of the voice in males
   - **b.** production of semen
   - **c.** menarche
   - **d.** maturation of the genitals
   - **e.** ovulation

2. **RECALL:** Which one is a stage of life that is not recognized by some cultures?
   - **a.** childhood
   - **b.** adolescence
   - **c.** adulthood
   - **d.** old age
   - **e.** infancy

3. **RECALL:** Which one is associated with a major challenge of adolescence, according to Erikson?
   - **a.** ego-integrity
   - **b.** intimacy
   - **c.** generativity
   - **d.** stagnation
   - **e.** identity

4. **RECALL:** Which one of the following groups becomes most influential in the lives of adolescents?
   - **a.** parents
   - **b.** teachers
   - **c.** peers
   - **d.** celebrities
   - **e.** children

5. **RECALL:** According to Kohlberg, as moral reasoning advances, individuals become less
   - **a.** emotional.
   - **b.** self-centered.
   - **c.** ruled by instinct.
   - **d.** attached to their parents.
   - **e.** questioning

6. **UNDERSTANDING THE CORE CONCEPT:** Which of the following is a cognitive change appearing in adolescence that affects one's ability to think more deeply and abstractly about the social pressures of adolescence?
   - **a.** depression
   - **b.** formal operational thought
   - **c.** conservation
   - **d.** assimilation and accommodation
   - **e.** nature and nurture

ANSWERS: 1. a 2. b 3. e 4. c 5. b 6. b

WHAT DEVELOPMENTAL CHALLENGES DO ADULTS FACE?

The transition from adolescence to young adulthood is marked by decisions about advanced education, career, and intimate relationships. Making such decisions and adjusting to the consequences are major tasks of adulthood because they shape the course of adult psychological development. But development doesn't stop there. Continuing pressures of careers, families, and friends, along with the relentless physical maturation (and eventual decline) of the body continually throw up new developmental challenges, as noted in the Core Concept for our discussion of adulthood:

Nature and nurture continue to produce changes throughout life, but in adulthood these changes include both growth and decline.

To see how developmental changes unfold in adulthood, let's begin with personality—where, for once, we find an area of agreement between Freud and psychologists who came after him.

Freud taught that adult development is driven by two basic needs: *love* and *work.* Abraham Maslow (1970) described these needs as love and belonging, which, when satisfied, allow the emergence of the needs for esteem and fulfillment. Other theorists divide the basic needs of adulthood into affiliation or social acceptance needs, achievement or competence needs, and power needs (McClelland, 1975, 1985; McClelland & Boyatzis, 1982). And in Erikson's theory, the early and middle adult years focus on needs for intimacy and "generativity." It is noteworthy that nearly every theorist has proposed some sort of social or affiliative need as a fundamental theme running through adulthood. But, because Erikson gave the most comprehensive account of adult personality, we will again concentrate on his theory.

Erikson's Theory of Young Adulthood: Intimacy versus Isolation

Young adulthood, said Erikson, poses the challenge of establishing close relationships with other adults (see Table 9.2 on p. 386). He described *intimacy* as the capacity to make a full commitment—sexual, emotional, and moral—to another person. The individual must resolve the conflict between wanting to establish closeness to another and fearing the vulnerability and risks such closeness can bring. Making intimate commitments requires compromising personal preferences, accepting responsibilities, and yielding some privacy and independence—but it can also bring great rewards. Failure to resolve this crisis leads to isolation and the inability to connect to others in meaningful ways.

Much research supports this notion of the need for close relationships with others. And it is the basis for one of the most practical applications that you can take with you from this text: *Anything that isolates us from sources of social support—from a reliable network of friends and family—puts us at risk for a host of physical ills, mental problems, and even social pathologies.* We are social creatures, and we need each other's help and support to be effective and healthy (Basic Behavioral Science Task Force, 1996).

For Erikson, a young adult must consolidate a clear and comfortable sense of identity (by resolving the crisis of adolescence) before being able to cope successfully with the risks and benefits of adult intimacy. In essence, you must

know who and what you are before you can begin to love someone else and share your life with that person. However, the sequence from identity to intimacy that Erikson described may not accurately reflect present-day realities. The trend in recent years has been for young adults to live together before marrying, to delay making contractual commitments to lifelong intimacy with one person. In addition, many individuals today must struggle with identity issues (for example, career choices) at the same time they are trying to deal with intimacy issues. We don't yet know how these changes will affect people or society in the long run. In general, however, we can say that life for young adults today offers more choices and more complications than did the same period of life for the generation described by Erikson.

To complicate matters, marriage (one common route to the successful resolution of the search for intimacy) often occurs more than once in an individual's life. In fact, married adults in the United States are now divorcing at a rate four times greater than adults did 50 years ago. Half of all U.S. marriages end in divorce (U.S. Bureau of the Census, 2002). Moreover, an increasing number of couples are cohabitating rather than getting married (Doyle, 2002b). This rise in divorce may result from individuals seeking intimacy before they resolve their own identities. It may also result from unrealistic expectations that members of a couple have of each other and of what constitutes an ideal marriage and family structure (Cleek & Pearson, 1985). On the other hand, there is evidence that communication and affection between spouses is now better than it was in earlier times and that those who have learned good communications skills have substantially improved their chances of avoiding divorce (Caplow, 1982; Markman & Notarius, 1993).

Married people are now more likely to see each other as partners and friends and less likely to feel constrained by the stereotype of what society expects of a "husband" or "wife." Partners in "peer marriages" talk with and help each other in ways that work best for their relationship, irrespective of traditional ideas about the man being "boss" or the wife being responsible for "women's work" (Schwartz, 1994). The key to such a fair and satisfying relationship is communication in which both partners feel able to openly express their hopes and fears (Klagsbrun, 1985). A mushrooming of knowledge on how good communication can maintain relationships has helped our culture to view marriage as a worthwhile investment and therapy as a valuable option for supporting such efforts (Gottman, 1994; Notarius, 1996). In brief, relating is no longer viewed as a set of skills that "comes naturally" with the establishment of intimacy. Instead, close relationships are seen as lifelong works in progress, worthwhile investments of time and energy whose quality can be improved with clearer self-understanding, effective conflict resolution, and good communication.

The Challenge of Midlife: Generativity versus Stagnation

According to Erikson, the next major opportunity for growth lies in the path to **generativity** during adult midlife. For those who have successfully met the earlier challenges of identity and intimacy, generativity involves a commitment to make a contribution to family, work, society, or future generations—a crucial challenge of one's 30s, 40s, and 50s. Thus, people in this phase of life broaden their focus beyond self and partner, often as volunteers in community service groups. Research confirms that adults who express a strong sense of being generative and productive also report high life satisfaction (McAdams et al., 1993). In contrast, those who have not resolved earlier crises of identity and intimacy may experience a "midlife crisis." Such people question past choices, becoming cynical and stagnant or, at the other extreme, self-indulgent

■ **Generativity** In Erikson's theory, a process of making a commitment beyond oneself to family, work, society, or future generations.

and reckless. The good news is that most people do not undergo a midlife emotional upheaval or suffer the "empty nest syndrome" (Clay, 2003a, b).

A brief summary of all of the theories we have discussed is shown in Table 9.4 on page 399.

New Perspectives on Women, Men, Work, and Family

Life in many 21st century households would astonish Freud and other theorists of yesteryear, say psychologists Rosalind Barnett and Janet Hyde (2001). For one thing, dual-career families are now the norm. For another, women are receiving professional training at an unprecedented level. A third change involves the increasing fluidity among roles as worker and family member: Men no longer (at least, not as often) define themselves only as workers and family providers, and women are less likely to define themselves solely as wives and mothers. For most people this provides an expanded source of social support and an increased sense of well-being.

At this writing, same-gender couples are visibly forming family units, getting married, and raising children. And, as every reader of this book will be aware, this has become highly politicized. You can be sure that research on gay and lesbian families is forthcoming from psychologists, but at present we have only a few dozen studies. They almost uniformly suggest that same-sex couples can have healthy, nurturing relationships, and that their children are as well-adjusted as children from heterosexual couples (APA Online, 2004; see also Redding, 2001, 2002; Rooney, 2002).

Finally, we should note that the population is becoming older, as increasing numbers of people live long enough to become elderly. Moreover, *baby boomers* (those born in the "baby boom" right after World War II) are retiring, and retirement is becoming both an issue and an opportunity for more people. The research says that women (as a group) are less prepared for retirement than are men, although among retirees the majority report being happier than they were during their working years (Kim & Moen, 2001). If our society is to face the problems of an older population, with even more time on their hands than teenagers have, we will need far more extensive research dealing with this group.

PSYCHOLOGY IN YOUR LIFE: THE LAST DEVELOPMENTAL CHALLENGES YOU WILL FACE

At the beginning of the 20th century, only 3% of the U.S. population was over 65. One hundred years later that figure is about 13%. When the baby boom generation reaches this age over the next few years, nearly one-fourth of our population will be in this oldest group.

If you are now a 17-year-old high school student, you will be in your early 40s by the year 2030, and you will have witnessed a profound demographic shift (change in population characteristics). By that time, more than 80 million Americans will be over 60 years of age. For the first time in history, the number of people in the 60-plus age group will outnumber those under 20 years of age. This will represent a dramatic reversal of all previous demographics and a potentially significant shift away from today's youth-oriented culture (Pifer & Bronte, 1986). Among the effects: Tattoos and body piercings will become common in nursing homes, and there will also be far fewer people to pay the Social Security and Medicare bills.

With drastic changes in our society's age distribution looming, it is more crucial than ever to understand the nature of aging as well as the abilities

TABLE 9.4 Overview of Developmental Theories

Theorist	Continuity/ Discontinuity	Topic/Area of Coverage	Key Concept
Piaget	Discontinuity	Cognitive development	Formal operations
Kagan	N/A	Social development	Temperament
Vygotsky	Discontinuity	Social/cognitive development	Zone of proximal development
Erikson	Discontinuity	Psychosocial development	Conflicts
Kohlberg	Discontinuity	Moral development	Reasoning
Kübler-Ross	Discontinuity	Social development	Thanatology

and needs of the elderly (Roush, 1996). The problem of dealing with an aging population is even more pressing in Third World countries, where incomes and standards of living are low and where health care resources are minimal (Holden, 1996a). And, on a personal level, it may be helpful to anticipate some of the developmental challenges you will face in the last phase of your life.

Ego-Integrity versus Despair According to Erikson, an increasing awareness of your own mortality and of the changes in your body, behavior, and social roles will set the stage for late adulthood. Erikson called the crisis he identified at this stage *ego-integrity versus despair.* Ego-integrity, the healthy end of this dimension, involves the ability to look back on life without regrets and to enjoy a sense of wholeness. For those whose previous crises had unhealthy solutions, however, aspirations may remain unfulfilled, and these individuals may experience futility, despair, and self-deprecation. Sadly, they often then fail to resolve the crisis successfully at this final developmental stage.

In general, Erikson characterizes old age as a time of new challenges. What are the tasks of old age, and what resources and limitations must we confront as we look ahead to the autumn of our lives? In a series of interviews with middle-aged and older men and women, Ryff (1989) found that nearly everyone of both sexes defined "well-being" in terms of relationships with others: being a caring, compassionate person and having a good social support network. Respondents also emphasized the value of accepting change, enjoying life, and cultivating a sense of humor.

New Perspectives on Aging From a biological perspective, aging typically means decline: Energy reserves are reduced, cell machinery functions less efficiently, and muscle tone diminishes. From a cognitive perspective, however, we will see that aging is no longer synonymous with decline (Qualls & Abeles, 2000). In fact, many abilities, including expert skills and some aspects of memory, may improve with age (Azar, 1996; Krampe & Ericsson, 1996). A lifetime's accumulation of experience may finally culminate in wisdom—if the mind remains open and active. Thus, we see that theories of aging are models of balance or trade-offs: In old age, a person may lose energy reserves but gain an ability to control emotional experiences and thereby conserve energy. In other words, we can expect two kinds of changes—gains and losses—as we grow older (Baltes, 1987).

Some of the most obvious changes that occur with age affect people's physical appearances and abilities. As we age, we can expect our skin to wrinkle, our hair to thin and gray, and our height to decrease an inch or two. Our hearts and lungs operate less efficiently, so we can expect decreased physical stamina. We can also expect some of our senses to dull. These changes occur and develop gradually, so we have ample opportunity to gauge them

● Older people who pursue high levels of environmental stimulation tend to maintain higher levels of cognitive abilities.

and try to adjust. Successful aging takes into consideration both individual potential and realistic limits (Baltes, 1993). Consider how an individual might make the most of the following resources he or she has, given each of the changes accompanying aging:

- *Vision:* As we age, the lenses in our eyes become discolored and less flexible, affecting both color vision and distance vision. Most people over 65 experience some loss of visual acuity, and without corrective lenses half of the elderly would be considered legally blind. Glasses do aid in adjusting to these changes in vision, however, especially for night driving or close work such as reading.
- *Hearing:* Diminished hearing is common among those 60 and older, especially the ability to hear high-frequency sounds. Problems can ensue if the loss is undetected or denied (Maher & Ross, 1984; Manschreck, 1989). A person may come to believe that others are deliberately whispering to avoid being heard, leading to a mild form of paranoia (belief that one is being victimized). Those with a hearing loss might explain others' actions inaccurately because they lack information and blame their misinterpretations on evil intentions instead of simple bad hearing (Zimbardo et al., 1981). Fortunately, early hearing-aid therapy can be more effective than later psychotherapy. Hearing aids can compensate for much of one's hearing loss. In addition, those close to someone with a probable hearing loss can help them by speaking in lower-pitched tones, enunciating clearly, and reducing background noise.
- *Thinking, learning, and problem-solving:* A great fear about aging is that it is accompanied by the loss of mental abilities. But is this fear justified? Certain parts of the brain, particularly the frontal lobes, do lose mass as we age, but there is little evidence that this causes a general mental decline in healthy adults. Performance on tasks requiring imagination, such as vivid imagery strategies for memorizing, does seem to decline with age (Baltes & Kliegl, 1992). And people do acquire information more slowly by the time they are in their 70s and 80s. By that age, many older people—but not all—begin to show some decline in cognitive abilities. The older the group, the more variation we find (Kramer & Willis, 2002). On the other hand, the decline for the average person may not be as severe as folk wisdom had assumed (Helmuth, 2003c). Brain-imaging studies suggest that older people's brains compensate by processing information differently, bringing more regions into play (Cabeza, 2002; Helmuth, 2002). In fact, there is new research showing that moderate physical fitness training improves cognitive abilities in older adults and may forestall or even prevent age-related mental decline (Colcombe et al., 2004). Moreover, the evidence suggests that some abilities actually improve with age. Vocabulary, for example, is consistently better in older adults, as are social skills. And, accomplished with regard to skilled performance, musicians have been shown to improve well into their 90s (Krampe & Ericsson, 1996). Psychologists are now exploring age-related gains in wisdom, such as expertise in practical knowledge and life experience (Baltes, 1990).
- *Memory:* A common complaint among older adults is that their ability to remember things is not as good as it used to be. Most of these age-related memory difficulties appear in a part of the memory system that processes and stores new information (Poon, 1985). Aging does *not* seem to diminish access to knowledge or events that occurred long ago, so an elderly person may have to ask the name of a new acquaintance once or twice before finally remembering it but may have no trouble recalling the names of old friends or celebrities. A more important concern might be that people

explain memory loss differently depending on the age of the forgetful person. Using a double standard, younger adults attribute other young adults' memory failures to lack of effort but those of older adults to loss of ability (Parr & Siegert, 1993).

Particularly worrisome to older people is **Alzheimer's disease,** a degenerative disorder of the brain that produces both diminished thinking abilities and memory problems. Ultimately, it can cause death. Alzheimer's disease is estimated to occur in about 4% of the population over the age of 65, with the incidence increasing with age, to over 50% in people beyond age 85 (National Institute on Aging, 2004). One of the early signs involves memory problems, causing many older persons to become anxious when they are unable to remember a name or an event—a difficulty to which they would have given little thought when younger. It is an especially frightening disorder because it can render people helpless, rob them of their ability to make new memories, and make them forget loved ones.

- *Sexual functioning:* One myth about aging is that elderly people cannot or should not be sexually active. Belief in such a myth can be a greater obstacle than any physical limitations to experiencing satisfying sex in late adulthood. There is no age, for either men or women, at which the capability for arousal or orgasm ceases. (This is particularly true now that drugs, such as the well-advertised Viagra, have enhanced erectile ability for millions of older men.) And while sex loses its reproductive functions in late adulthood, it doesn't lose its capacity for providing pleasure. Regular sexual practice also enhances healthy aging because it provides arousal, aerobic exercise, fantasy, and social interaction (Ornstein & Sobel, 1989). Experience and creativity clearly compensate for minor physical changes or losses of physical stamina.
- *Social interaction:* An unfortunate consequence of living a long life is outliving some friends and family members. In addition, the reduced mobility associated with aging can make people become somewhat less active socially in later adulthood. While older adults reduce the extent of their social contacts, they remain more invested in those ties they choose to keep. Maintaining even a single intimate relationship can markedly improve personal health, as can living with a beloved pet (Siegel, 1990). Research shows that as people age, they tend to engage in **selective social interaction,** maintaining only the most rewarding contacts for the investment of precious physical and emotional energy (Carstensen, 1987, 1991; Lang & Carstensen, 1994).
- *Emotions:* While old age is often seen as a time of depression and restriction of emotions, the evidence doesn't support this view in healthy older adults, although age often improves people's ability to *control* their emotions—when they want to (Lawton, 2001). Moreover, older individuals report experiencing more positive emotions and fewer negative emotions than do younger adults (Mroczek, 2001).

What can be done for those who experience trouble or personal difficulty in aging? Many elderly people have discovered particular strategies that help them age successfully. For example, older adults can remain both active and close to people by doing volunteer work in the community, joining clubs and classes, or spending time with grandchildren. In addition, we might learn lessons from other cultures where older citizens are well respected and venerated for their wisdom. Before this happens, however, people must overcome stultifying stereotypes of the elderly as incapable and incompetent (Brewer et al., 1981).

Alzheimer's disease
A degenerative brain disease usually noticed first by its debilitating effects on memory.

Selective social interaction
Choosing to restrict the number of one's social contacts to those who are the most gratifying.

One other important development theory to consider as we look toward later adulthood was proposed by Elisabeth Kübler-Ross. In her 1969 book *On Death and Dying*, she described the developmental changes that terminally ill and/or dying individuals experience. Kübler-Ross identified five stages of death and dying: **denial, anger, bargaining, depression,** and **acceptance.** Although in her early writings she stated that each patient goes through them in order, as time went on she was shocked to learn that some health care providers were actually trying to force patients through the stage at set points in time. She later came to assert that each individual experiences the stages differently according to his or her own experience. As we have seen throughout development, not everyone develops in the same way or in the same timeframe, and Kübler-Ross argued that this is true for death and dying as well.

What, then, would be a good strategy for dealing with the challenges of aging? Perhaps successful aging consists of making the most of gains while minimizing the impact of losses (Schulz & Heckhausen, 1996). Additionally, it is helpful to realize that losses of specific abilities need not represent threats to one's sense of self. As one's physical and psychological resources change, so do one's goals (Carstensen & Freund, 1994). In this fashion, late adulthood may be a time not of increasing frustration, but of increasing fulfillment.

DEVELOPMENTAL PSYCHOLOGY: THE STATE OF THE ART

Developmental psychology has shown beyond doubt that development—physical, cognitive, social, and emotional—continues throughout the lifespan. And the older we get, the more diversity we find among our age mates, even though we are facing many of the same issues or "life crises."

The most recent research has shown us that people at all ages have more abilities than previous generations of developmental psychologists believed. We now know, for example, that newborns can imitate facial expressions, that infants can count, and that thinking can be sharp in the elderly.

Much remains to be discovered, however. Highly effective treatments for many disorders connected to development, such as autism and Alzheimer's disease, remain just out of reach. The decoding of the human genome also promises insights into developmental problems—but those problems, too, remain unsolved. And finally (although this developmental "to-do" list is incomplete), the major social changes occurring in our society—including the redefinition of work and family, retirement, increased leisure time, instant access to information, and gender equality—all are having their effects on development in ways that we don't yet fully understand.

- **Denial** Refusing to believe the individual is sick.
- **Anger** Patient displays anger that they are sick, "why me!"
- **Bargaining** Making a deal, in return for a cure, they will fulfill promises.
- **Depression** Generally depressed affect includes sleep, loss of appetite, etc.
- **Acceptance** Patient realizes death is inevitable and accepts fate.

CHECK YOUR UNDERSTANDING

1. **RECALL:** According to Erikson, a person who successfully faces the issue of intimacy versus isolation will have
   a. a meaningful career.
   b. children.
   c. a thirst for knowledge.
   d. social support.
   e. a robust sense of self.

2. **RECALL:** According to Erikson, people at midlife most want to
   a. have the freedom and independence to pursue their leisure interests.
   b. hang out with their friends.
   c. develop independence.
   d. maintain or improve their physical appearance.
   e. make a contribution to their career, society, or future generations.

3. **APPLICATION:** A major demographic shift is now in progress. This change involves
   - **a.** a culture that is increasingly focusing on youth.
   - **b.** an increase in the average age of the population.
   - **c.** the roles of worker and parent becoming more rigidly defined.
   - **d.** fewer women assuming professional roles.
   - **e.** fewer men becoming primary caregivers.

4. **UNDERSTANDING THE CORE CONCEPT:** Old age eventually means that the person will experience decline in
   - **a.** thinking and problem-solving abilities.
   - **b.** social support from family.
   - **c.** vision and hearing.
   - **d.** emotional well-being.
   - **e.** ego-integrity.

ANSWERS: 1. d 2. e 3. b 4. c

USING PSYCHOLOGY TO LEARN PSYCHOLOGY

Cognitive Development in College

Does your arrival at the formal operational stage, in the middle or high school years, signal the end of the cognitive line? Or will your thinking abilities continue to develop as you go on to college? A study by developmental psychologist William Perry suggests that your perspective on learning will change and mature as your college experience unfolds. This prediction is based on a sample of students that Perry followed through their undergraduate years at Harvard and Radcliffe. Specifically, he found that students' views of psychology and their other social science courses changed radically, as did their view of what they were there to learn (Perry, 1970, 1994).

At first, students in Perry's study had the most difficulty coming to grips with the diverse and conflicting viewpoints they encountered in their courses. For example, many confronted, for the first time, the idea that reasonable people can disagree—even about their most cherished "truths" concerning good and evil, God, nature, and human nature:

> A few seemed to find the notion of multiple frames of reference wholly unintelligible. Others responded with violent shock to their confrontation in dormitory bull sessions, or in their academic work, or both. Others experienced a joyful sense of liberation. (Perry, 1970, p. 4)

In dealing with this academic culture shock, Perry's students passed through a series of distinct intellectual stages that were reminiscent of Piaget's stages. And, although they arrived at college at different levels of cognitive maturity and continued to develop at different rates, all progressed through the same intellectual stages in the same sequence. Here are some of the highlights of this intellectual journey:

- Students at first typically see a college or university as a storehouse of information—a place to learn the Right Answers. Thus, they believe it is the professor's job to help students find these answers.
- Sooner or later, students discover an unexpected—perhaps shocking—diversity of opinion, even among the experts. At this stage, college students are likely to attribute conflicting opinions to confusion among poorly qualified experts.
- Eventually, students begin to accept diverse views as legitimate—but only in the fuzzy areas (such as psychology, other social sciences, and humanities) where experts haven't yet found the Right Answers. They decide that in subjects where the Right Answers haven't been nailed down, professors grade them on "good expression" of their ideas.
- Next, some students (not all) discover that uncertainty and diversity of opinion are everywhere—not just in the social sciences and humanities. They typically solve this problem in their minds by dividing the academic world into two realms: (a) one in which Right Answers exist (even though they haven't all been discovered) and (b) another in which anyone's opinion is as good as anyone else's. Often, at this stage, they perceive math and the "hard" sciences as the realm of Right Answers, leaving the social sciences and humanities in the realm of opinion.
- Finally, the most mature students come to see that multiple perspectives exist in all fields of study.

The students who achieve the final stage begin to see "truth" as tentative. They now realize that knowledge is always building and changing—even in the "hard" sciences. And they realize that a college education is not just learning an endless series of facts. Rather, it is learning about the important *questions* and major *concepts* of a field. In this book we have called them "Key Questions" and "Core Concepts."

At what stage will you find yourself?

CHAPTER SUMMARY

HOW DO PSYCHOLOGISTS EXPLAIN DEVELOPMENT?

Developmental psychologists study change and growth in physical and mental functioning throughout the lifespan. They have resolved the old nature–nurture issue by pointing out that nature and nurture always interact. Nevertheless, the issue continues to be debated. To weigh the relative contributions of heredity and environment, psychologists employ a variety of methods, including observations of identical twins, fraternal twins, and adopted children. The resulting studies show that many complex behaviors have a genetic component. Another controversy in developmental psychology involves continuity versus discontinuity. Psychologists who speak of developmental stages are taking the discontinuity view.

Development is a process of growth, change, and consistency brought about by an interaction of heredity and environment.

WHAT CAPABILITIES DOES THE CHILD POSSESS?

While the newborn mind was once considered a "blank slate," we now know that newborns possess certain innate abilities that help them survive. During the prenatal period, the organism progressively becomes a zygote, an embryo, and a fetus. Teratogens can damage the organism at any of these stages. Development of the brain proceeds at a rapid pace during the prenatal period, laying the foundation for the neonate's abilities to find food, interact with others, and avoid harm. Developmental research shows that infants are born with many sensory capabilities, preferences, and motor reflexes, plus the abilities to learn new responses that develop throughout childhood.

Developmental psychologists have been especially interested in the relationship between child and mother (or other caregiver). Ainsworth found that children may become either securely or insecurely attached. Attachment patterns established in infancy often persist into adulthood. Harlow's research suggests that infants seek contact comfort in the relationship with the mother.

Developmental psychologists have also looked carefully at the sequence of physical maturation and the influence of experience—particularly social interaction and physical contact—on the times at which various physical abilities, such as sitting and walking, develop.

Newborns have innate abilities for finding nourishment, interacting with others, and avoiding harmful situations, while the developing abilities of infants and children rely more on learning.

WHAT ARE THE DEVELOPMENTAL TASKS OF INFANCY AND CHILDHOOD?

Piaget's theory says that assimilation and accommodation are the two basic processes affecting our mental schemes and so underlie cognitive development. Piaget also proposed that children's cognitive development goes through four stages: the sensorimotor, the preoperational, the concrete operational, and the formal operational stages. New abilities, such as mental representation, object permanence, conservation, and mental operations, mark the emergence of successive stages. Newer theory and research have, however, modified many of Piaget's ideas.

Social and emotional development require that the child learn the rules of society and also develop a theory of mind. The basis for socialization is an innate temperament, which can be modified by experience, particularly by the four parenting styles: authoritative, authoritarian, permissive, and uninvolved. Day care is ever more frequently used in the United States, and research shows it can have positive effects on children. Children are also influenced by peers, school, and the media. Gender differences in socialization appear in the types of friendships formed by boys and girls.

Certain developmental disorders, including mental retardation, autism, dyslexia, and ADHD, are most frequently seen in childhood. In most cases, existing treatments can help, but they are far from cures for these disorders.

Erikson's theory proposes that personality develops through a series of crises, each focused on resolving an issue about oneself and others. These issues define four stages of psychosocial development in childhood, characterized by these issues: trust versus mistrust, autonomy versus self-doubt, initiative versus guilt, and competence versus inferiority.

Infants and children face especially important developmental tasks in the areas of cognition and social relationships—tasks that lay a foundation for further growth in adolescence and adulthood.

WHAT CHANGES MARK THE TRANSITION OF ADOLESCENCE?

The meaning of adolescence varies from culture to culture, although developmental psychologists define adolescence as a stage that starts at puberty. For Americans, the transitions of adolescence typically focus on rapid physical maturation and the development of a sexual, social, and gender identity, although there are few distinct rites of passage. Cognitive development in adolescence involves emerging abstract thought, which accompanies the formal operational stage. Peers become increasingly influential, and, for most, the family diminishes in influence. Some become delinquent. For the majority, the journey through adolescence is not unduly traumatic, but for some it is marked by loneliness or even suicide.

Sexual issues are especially important in adolescence, whether the individuals are homosexual or heterosexual. For the latter group, the past decade has witnessed a decline in sexual intercourse among adolescents.

Kohlberg's theory of moral reasoning, built on Piaget's foundation, is also a stage theory. In Kohlberg's view, lower stages involve concerns with personal consequences, and higher stages have a broader focus on principles of ethical living. It seems to be applicable across a variety of cultures, although some critics have raised issues of gender bias in the theory.

● **Adolescence offers new developmental challenges growing out of physical changes, cognitive changes, and socioemotional pressures.**

● WHAT DEVELOPMENTAL CHALLENGES DO ADULTS FACE?

The challenges of adulthood focus on social needs, particularly achieving intimacy and a sense of generativity. In recent years, major social changes in sex roles and the configuration of the family, career paths, and retirement have occurred, all of which affect the course of psychological development. In later adulthood, individuals must maintain a sense of integrity despite some physical changes and losses.

Erikson believed that successful resolution of earlier life crises can enable one to face the end of life with acceptance and even a sense of satisfaction. New perspectives on aging, however, show that this period of life is marked by both gains and losses, notably in vision, hearing, intelligence, memory, sexual functioning, and social interaction. For some aging is very difficult, but for others it is a time of increasing fulfillment.

● **Nature and nurture continue to produce changes throughout life, but in adulthood these changes include both growth and decline.**

REVIEW TEST

For each of the following items, choose the single correct or best answer. The correct answers appear at the end.

1. The term *nature* refers to the effects of _____, and *nurture* refers to the effects of _____.
   a. continuity; discontinuity
   b. parents; peers
   c. assimilation; accommodation
   d. heredity; environment
   e. acceptance; bargaining

2. A psychologist taking the discontinuity view might see development as
   a. a gradual process.
   b. a matter of learning.
   c. entirely genetic.
   d. a series of stages.
   e. strictly the result of parenting style.

3. About eight weeks after conception, the developing human organism is known as
   a. a zygote.
   b. an embryo.
   c. an infant.
   d. a neonate.
   e. a fetus.

4. Which of the following is(are) true of the physical abilities of the newborn infant?
   a. At birth, babies already have preferences for particular tastes and smells and dislikes for others.
   b. Just moments after birth, a neonate may turn in the direction of a voice or reach out an exploring hand.
   c. While babies are born with poor eyesight, they soon learn to detect large objects and high-contrast patterns.
   d. All of the above are true.
   e. None of the above is true.

5. Which of the following utterances illustrate(s) overregularization in language development?
   a. "Babababa."
   b. "Me gots two foots and two handses."
   c. "Drink milk, all gone."
   d. "Want cookie."
   e. All of the above illustrate overregularization.

6. "Hey! That's not fair," complains Judi. "Tonio has more ice cream than me." Actually, both Judi and Tonio received a single scoop, but Tonio has stirred his around so it seems to fill the dish, while Judi's scoop is more compact. Judi's complaint indicates that she has not yet acquired the concept of _____ that affects how children think about the physical properties of things.
   a. centration
   b. egocentrism
   c. conservation
   d. object permanence
   e. ego-integrity

7. Harry and Margaret Harlow conducted landmark studies of the behaviors of baby monkeys who were separated from their mothers and had access only to mother "dummies" in their cages. This work confirmed that
   a. genuine attachment is possible only with the infant's biological mother.
   b. contact comfort and physical touch are important for healthy early development.
   c. the "cupboard theory of attachment" is true for both humans and nonhumans.
   d. nonhuman infants will imprint on and restrict social behavior to the first visually prominent thing they see after birth.
   e. all animal research is generalizable to humans.

8. For Erikson, the psychosocial crisis of _____ is addressed by skill development and social interaction during the elementary school years, when children must explore their abilities, talents, and peer relationships.
   a. trust versus mistrust
   b. autonomy versus doubt
   c. competence versus inferiority
   d. identity versus role confusion
   e. ego-integrity versus despair

9. The briefest summary of the concerns and issues of adult development might simply be
   a. success and security.
   b. power and conquest.
   c. youth and beauty.
   d. death and dying.
   e. love and work.

10. In late adulthood, loss of _____ has often been associated with feelings of paranoia and social isolation.
   a. intellectual abilities
   b. sexual functioning
   c. one's spouse
   d. hearing
   e. sensory modalities

ANSWERS: 1. d 2. d 3. e 4. d 5. b 6. c 7. b 8. c 9. e 10. d

KEY TERMS

Developmental psychology (p. 362)
Nature–nurture issue (p. 362)
Interaction (p. 362)
Identical twins (p. 363)
Fraternal twins (p. 363)
Continuity view (p. 364)
Discontinuity view (p. 364)
Developmental stages (p. 365)
Prenatal period (p. 367)
Zygote (p. 367)
Embryo (p. 367)
Fetus (p. 367)
Placenta (p. 367)
Teratogens (p. 367)
Neonatal period (p. 368)
Infancy (p. 369)
Attachment (p. 370)
Imprinting (p. 370)
Contact comfort (p. 373)
Maturation (p. 373)
Schemas (p. 377)
Assimilation (p. 377)
Accommodation (p. 377)
Sensorimotor stage (p. 378)
Mental representation (p. 378)
Object permanence (p. 378)
Preoperational stage (p. 378)
Egocentrism (p. 378)
Animistic thinking (p. 379)
Centration (p. 379)
Irreversibility (p. 379)
Concrete operational stage (p. 379)
Conservation (p. 379)
Mental operations (p. 379)
Theory of mind (p. 381)
Temperament (p. 381)
Zone of proximal development (p. 382)
Psychosocial stages (p. 385)
Adolescence (p. 388)
Rites of passage (p. 388)
Puberty (p. 388)
Primary sex characteristics (p. 388)
Secondary sex characteristics (p. 388)
Formal operational stage (p. 389)
Generativity (p. 397)
Alzheimer's disease (p. 401)
Selective social interaction (p. 401)
Denial (p. 402)
Anger (p. 402)
Bargaining (p. 402)
Depression (p. 402)
Acceptance (p. 402)

AP* REVIEW: VOCABULARY

Match each of the following vocabulary terms to its definition.

1. Nature–nurture
2. Continuity view
3. Discontinuity view
4. Attachment
5. Assimilation
6. Accommodation
7. Temperament
8. Generativity
9. Selective social interaction
10. Neonatal period

_____ **a.** Mental process that modifies new information into existing schemas.

_____ **b.** In humans, this period extends though the first month after birth.

_____ **c.** An individual's characteristic manner of behavior or reaction.

_____ **d.** The view that development is gradual.

_____ **e.** A process of making a commitment beyond oneself to family, work, etc.

_____ **f.** Mental process that restructures existing schemas so that new information is better understood.

_____ **g.** Choosing to restrict the number of one's social contacts to those who are the most gratifying.

_____ **h.** The enduring social-emotional relationship between a child and parent/caregiver.

_____ **i.** Discussion about the relative importance of heredity and environment in development.

_____ **j.** The view that development proceeds in irregular "fits and starts."

AP* REVIEW: ESSAY

Use your knowledge of the chapter concepts to answer the following essay question.

Development involves the processes of growth and change from conception across the lifespan, including changes in physical, cognitive, and social behaviors. Focusing on the period of adolescence, give examples of the physical, cognitive, and social changes that occur. State how each of these three examples would be interpreted by the two sides of *either* the nature–nurture debate *or* the continuity–discontinuity controversy.

OUR RECOMMENDED BOOKS AND VIDEOS

ARTICLE

Sapolsky, R. (2001, November). The loveless man . . . who invented the science of love. *Scientific American,* 95–96. This is a review of Blum's *Love at Goon Park,* a study of attachment theorist Harry Harlow, the depressed yet disciplined scientist who isolated and studied miserable, lonely monkeys and discovered the importance to them (and to us) of touch, connection, and mother love.

BOOKS

Blum, D. (2002). *Love at Goon Park: Harry Harlow and the science of affection.* Boulder, CO: Perseus Books. Today we take for granted the importance of touch in expressing consolation, closeness, and sexual attraction, but the concept became commonplace only in the 1950s, with psychologist Harry Harlow's work on "contact comfort" among infant monkeys. From Harlow's controversial research and poignant photographs of frightened baby monkeys came research on human attachment as well as applications to romantic love. ("Goon Park" was the nickname for the often misread address of Harlow's University of Wisconsin laboratory at "600 N. Park").

Colapinto, J. (2001). *As nature made him: The boy who was raised as a girl.* New York: HarperPerennial. When a newborn boy lost his penis in a botched circumcision, his parents were advised by an "expert" to raise him as a girl, with a girl's name, clothing, and new gender instruction. Originally presented as a successful effort in identity shaping, the treatment became a developmental nightmare for the growing child, who at 14 decided to live life as a male instead. Presenting family with sympathy and doctors with disdain, the narrative becomes a gripping story of an individual in the crossfire of nature and nurture.

Kilbourne, J. (2000). *Can't buy my love: How advertising changes the way we think and feel.* New York: Free Press. The average American is exposed to over 3000 advertisements a day, all promising that love, sex, power, or self-esteem can be acquired simply by purchasing clothing, cosmetics, shoes, or cars. Educational psychologist and media expert Jean Kilbourne explores these manipulative messages and the damage they do—especially to young women and girls.

Snowdon, D. (2001). *Aging with grace: What the nun study teaches us about leading longer, healthier, and more meaningful lives.* New York: Bantam Doubleday Dell. In the late 1980s, the author undertook a study of aging and disability in a community of elderly Catholic nuns; but he eventually found he could not maintain a scholarly distance from them and began to care and learn about them individually. Here he presents the lessons he learned from them about the blend of community, commitment, activity, and health.

VIDEOS

Marvin's Room. (1996, color, 98 min.). Directed by Jerry Zaks; starring Meryl Streep, Diane Keaton, Leonardo DiCaprio. Estranged sisters face family crises as one, who is sick, calls on help from the other, who is losing a battle with her teenaged son. This cinematic tangle of family tensions, insights, and oversights captures the "messiness" of real-life family relationships. (*Rating PG-13*)

Welcome to the Dollhouse. (1996, color, 87 min.). Directed by Todd Solondz; starring Heather Matarazzo, Brandon Sexton, Jr., Daria Kalinina, Matthew Faber. The pain of puberty is depicted through the eyes of a young woman whose suburban parents are amazingly unsympathetic and favor her baby sister and whose school experience seems to be the Seventh Grade from Hell. The film has good performances and a lot of humor. (*Rating R*)