

Psychology in the News

Age Record Broken as 70-Year-Old Gives Birth

MUZAFFARNAGER, INDIA, July 5, 2008. At age 70, Omkari Panwar has become the oldest woman ever to give birth after delivering twins, a boy and a girl, by emergency cesarean section. The babies arrived a month early and weigh only two pounds each, but are healthy.

Ms. Panwar and her 77-year-old husband, Charan Singh Panwar, already have two adult daughters and five grandchildren, but they were determined to produce a male heir. To pay for in vitro fertilization, Charan, a retired farmer, sold his buffaloes, mortgaged his land, spent his savings, and took out a credit card loan. His family now relies on financial help from friends, but he says that he can die a happy man and proud father because he finally has a son.

Other women around the world have had babies when they were past the age of 60. In Los Angeles in 1997, Arceli Keh, 63, gave birth to a daughter with

sperm donated by her husband. In India in 2003, a 65-year-old schoolteacher, Satyabhama Mahapatra, gave birth to her first child, a boy, after 50 years of marriage; she was impregnated with sperm from her husband and an egg from her 26-year-old niece. In Romania in 2005, a 66-year-old unmarried professor of literature, Adriana Iliescu, became pregnant through in vitro fertilization using sperm and an egg from anonymous donors. And in 2006, in Spain, Carmela Bousada, who had no husband or other children, gave birth to twins a week before her 67th birthday.

Across the globe, countries are wrestling with the complicated biological, ethical, and legal issues that late in vitro pregnancies create. In some European nations, legislation prohibits in vitro procedures after age 50. But opponents of such restrictions point out that no country prohibits older men from conceiving children, so there should likewise be no limits on women, as long as they are healthy enough to maintain a pregnancy.



Omkari Panwar, at 70, the world's oldest mother, and her husband Charan Singh Panwar, 77, hold their infant son and daughter, born a month early. The Panwars have two daughters and five grandchildren but wanted a male heir.

From Conception through the First Year

Language Development

Cognitive Development

Moral Development

Gender Development

Adolescence

Adulthood

The Wellsprings of Resilience

Psychology in the News, Revisited

Taking Psychology with You: Bringing Up Baby

Development Over the Life Span

How do you react to the idea of a couple in their 70s having twins? Would it make any difference if the mother were “only” 65 years old, or 60? Would it make any difference if their motive were something other than a desire for a male heir? What if the parents had no other children? And do you feel the same about older fathers as you do about older mothers?

There were no headlines when James Doohan, who had played Scotty in the original *Star Trek* series and movies, became a father for the fourth time at the age of 80 (his second wife, Wende, was then age 43). Doohan died five years later of pneumonia and Alzheimer’s disease. Was it loving and natural, or selfish and unethical, for James Doohan to father a child when he was 80? When Carmela Bousada’s mother died at the age of 101, Bousada, at 66, decided it was “the right time” for her to have children.

Is there a right time to become a parent? For that matter, is there a right time to do anything in life—go to school, get married, retire . . . die? The universal human journey from birth to death was once far more predictable than it is today. Going to college, choosing a job, starting a family, and advancing up the ladder to retirement were all events that tended to happen in sequence. But because of demographic changes, an unpredictable economy, advances in reproductive technology, and many other forces, millions of people are now doing things out of order, if they do them at all. Today, going to college, having children, changing careers, or starting a family may occur in almost any decade of adulthood.

Developmental psychologists study physiological and cognitive changes across the life span and how these are affected by a person’s genetic predispositions, culture, circumstances, and experiences. Some focus on children’s mental and social development, including **socialization**, the process by which children learn the rules and behavior expected of them by society. Others specialize in the study of adolescents, adults, or the very old. In this chapter, we will explore some of their major findings, starting at the very beginning of human development, with the period before birth, and continuing through adulthood into old age. And at the end of the chapter, you will find out what has happened to some of those older mothers since they had their babies.





YOU are about to learn...

- the stages of prenatal development and some factors that can harm an embryo or fetus during pregnancy.
- how culture affects a baby's physical maturation.
- why contact comfort and attachment are so important for infants (and adults).
- the varieties of infant attachment.

From Conception through the First Year

A baby's development, before and after birth, is a marvel of *maturation*, the sequential unfolding of genetically influenced behavior and physical characteristics. In only 9 months of a mother's pregnancy, a cell grows from a dot this big (.) to a squalling bundle of energy who looks just like Aunt Sarah. In another 15 months, that bundle of energy grows into a babbling toddler who is curious about everything. No other time in human development brings so many changes so fast.

Prenatal Development

Prenatal development is divided into three stages: the germinal, the embryonic, and the fetal. The *germinal stage* begins at fertilization, when the male sperm unites with the female ovum (egg); the fertilized single-celled egg is called a *zygote*. The *zygote* soon begins to divide, and in 10 to 14 days, it has become a cluster of cells that attaches itself to the

wall of the uterus. The outer portion of this cluster will form part of the placenta and umbilical cord, and the inner portion becomes the embryo. The placenta, connected to the embryo by the umbilical cord, serves as the growing embryo's link for food from the mother. It allows nutrients to enter and wastes to exit, and it screens out some, but not all, harmful substances.

Once implantation is completed, about two weeks after fertilization, the *embryonic stage* begins, lasting until the eighth week after conception, at which point the embryo is only 1½ inches long. During the fourth to eighth weeks, the hormone testosterone is secreted by the rudimentary testes in embryos that are genetically male; without this hormone, the embryo will develop to be anatomically female. After eight weeks, the *fetal stage* begins. The organism, now called a *fetus*, further develops the organs and systems that existed in rudimentary form in the embryonic stage.  **Explore**

Although the womb is a fairly sturdy protector of the growing embryo or fetus, the prenatal environment—which is influenced by the mother's own health, allergies, and diet—can affect the course of development, for example, by predisposing an infant to later obesity or immune problems (Coe & Lubach, 2008). Most people don't realize it, but fathers play an important role in prenatal development, too. Fathers over 50 have three times the risk of conceiving a child who develops schizophrenia as do fathers under age 25 (Malaspina, 2001); teenage fathers have an increased risk that their babies will be born prematurely or have low birth weight; babies of men exposed to solvents and other chemicals in the workplace are more likely to be miscarried, be stillborn, or develop cancer later in life; and being an older father increases the probability that a child will be autistic or bipolar (Frans et al., 2008; Reichenberg et al., 2006; Saey, 2008).

During a woman's pregnancy, some harmful influences can cross the placental barrier (O'Rahilly & Müller, 2001). These influences include the following:

1 German measles (rubella), especially early in the pregnancy, can affect the fetus's eyes, ears, and heart. The most common consequence is deafness. Rubella is preventable if the mother has been vaccinated, which can be done up to three months before pregnancy.

2 X-rays or other radiation and toxic substances can cause fetal deformities and cognitive abnormalities that can last throughout life. Exposure

socialization The processes by which children learn the behaviors, attitudes, and expectations required of them by their society or culture.

 **Explore Embryonic Period** on myspsychlab.com

Developmental psychologists study people across the life span. They would have a living laboratory with this six-generation family: Sara Knauss, age 118 (center); her daughter, age 95 (right), her grandson, age 73 (center), her great granddaughter, age 49 (standing with her dad), her great-great granddaughter, age 27 (on floor), and her great-great-great grandson, age 3.



to lead is associated with attention problems and lower IQ scores, as is exposure to mercury, found most commonly in contaminated fish (Newland & Rasmussen, 2003).

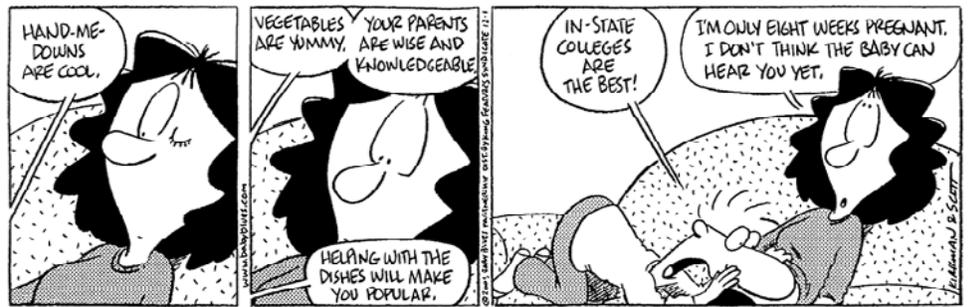
3 Sexually transmitted diseases can cause mental retardation, blindness, and other physical disorders. Genital herpes affects the fetus only if the mother has an outbreak at the time of delivery, which exposes the newborn to the virus as the baby passes through the birth canal. (This risk can be avoided by having a cesarean section.) HIV, the virus that causes AIDS, can also be transmitted to the fetus, especially if the mother has developed AIDS and has not been treated.

4 Cigarette smoking during pregnancy increases the likelihood of miscarriage, premature birth, an abnormal fetal heartbeat, and an underweight baby. The negative effects may last long after birth, showing up in increased rates of infant sickness, sudden infant death syndrome (SIDS), and, in later childhood, hyperactivity, learning difficulties, asthma, and even antisocial behavior (Button, Thapar, & McGuffin, 2005).

5 Regular consumption of alcohol can kill neurons throughout the fetus's developing brain and impair the child's later mental abilities, attention span, and academic achievement (Ikonomidou et al., 2000; Streissguth, 2001). Having more than two drinks a day significantly increases the risk of *fetal alcohol syndrome (FAS)*, which is associated with low birth weight, a smaller brain, facial deformities, lack of coordination, and mental retardation. Because alcohol can affect many different aspects of fetal brain development, most specialists recommend that a pregnant woman abstain from drinking alcohol.

6 Drugs other than alcohol can be harmful to the fetus, whether they are illicit ones such as cocaine and heroin, or commonly used legal substances such as antibiotics, antihistamines, tranquilizers, acne medication, and diet pills. Cocaine can cause subtle impairments in children's cognitive and language abilities and larger ones in the ability to manage impulses and frustrations (Lester, LaGasse, & Seifer, 1998; Stanwood & Levitt, 2001).

The lesson is clear. A pregnant woman does well to stop smoking and drinking alcohol, and to take no other drugs of any kind unless they are



Many parents hope to have an influence on their offspring even before their babies are born.

medically necessary—and then to accept the fact that her child will never be properly grateful for all that sacrifice!

The Infant's World

Newborn babies could never survive on their own, but they are far from being passive and inert. Many abilities, tendencies, and characteristics are universal in human beings and are present at birth or develop very early, given certain experiences. Indeed, experience plays a crucial role in shaping the infant's mind, brain, and gene expression right from the get-go. Newborn infants who get little touching will grow more slowly and release less growth hormone than their amply cuddled peers, and throughout their lives, they have stronger reactions to stress and are more prone to depression and its cognitive deficits (Diamond & Amso, 2008; Field, 2009).

Physical and Perceptual Abilities

Newborns begin life with several *motor reflexes*, automatic behaviors that are necessary for survival. They will suck on anything suckable, such as a



Infants are born with a grasping reflex; they will cling to any offered finger. And they need the comfort of touch, which their adult caregivers love to provide.

contact comfort In primates, the innate pleasure derived from close physical contact; it is the basis of the infant's first attachment.

separation anxiety The distress that most children develop, at about 6 to 8 months of age, when their primary caregivers temporarily leave them with strangers.

nipple or finger. They will grasp tightly a finger pressed on their tiny palms. They will turn their heads toward a touch on the cheek or corner of the mouth and search for something to suck on, a handy rooting reflex that allows them to find the breast or bottle. Many of these reflexes eventually disappear, but others—such as the knee-jerk, eye-blink, and sneeze reflexes—remain.

Babies are also equipped with a set of inborn perceptual abilities. They can see, hear, touch, smell, and taste (bananas and sugar water are in, rotten eggs are out). A newborn's visual focus range is only about 8 inches, the average distance between the baby and the face of the person holding the baby, but visual ability develops rapidly. Newborns can distinguish contrasts, shadows, and edges. And they can discriminate their mother or other primary caregiver on the basis of smell, sight, or sound almost immediately.

Culture and Maturation Although infants everywhere develop according to the same maturational sequence, many aspects of their development depend on cultural customs that govern how their parents hold, touch, feed, and talk to them (Rogoff, 2003). In the United States, Canada, and Germany and most other European countries, babies are expected to sleep for eight uninterrupted hours by the age of 4 or 5 months. This milestone is considered a sign of neurological maturity, although many babies wail when the parent puts them in the crib at night and leaves the room.

But among Mayan Indians, rural Italians, African villagers, Indian Rajput villagers, and urban Japanese, this nightly clash of wills rarely occurs because the infant sleeps with the mother for the first few years of life, waking and nursing about every four hours. These differences in babies' sleep arrangements reflect cultural and parental values. Mothers in these cultures believe it is important to sleep with the baby so that both will forge a close bond; in contrast, many urban North American and German parents believe it is important to foster the child's independence as soon as possible (Keller et al., 2005; Morelli et al., 1992).

Attachment

Emotional attachment is a universal capacity of all primates and is crucial for health and survival all through life. The mother is usually the first and primary object of attachment for an infant, but in many cultures (and other species), babies become just as attached to their fathers, siblings, and grandparents (Hrdy, 1999).

Interest in the importance of early attachment began with the work of British psychiatrist John Bowlby (1969, 1973), who observed the devastating effects on babies raised in orphanages without touches or cuddles, and on other children raised in conditions of severe deprivation or neglect. The babies were physically healthy but emotionally despairing, remote, and listless. By becoming attached to their caregivers, Bowlby said, children gain a secure base from which they can explore the environment and a haven of safety to return to when they are afraid. Ideally, infants will find a balance between feeling securely attached to the caregiver and feeling free to explore and learn in new environments.

Contact Comfort Attachment begins with physical touching and cuddling between infant and parent. **Contact comfort**, the pleasure of being touched and held, is not only crucial for newborns; it continues to be important throughout life, releasing a flood of pleasure-producing and stress-reducing endorphins (see Chapter 14). In hospital settings, even the mildest touch by a nurse or physician on the patient's arm or forehead is reassuring psychologically and lowers blood pressure.

Margaret and Harry Harlow first demonstrated the importance of contact comfort by raising infant rhesus monkeys with two kinds of artificial mothers (Harlow, 1958; Harlow & Harlow, 1966). One, which they called the "wire mother," was a forbidding construction of wires and warming lights, with a milk bottle connected to it. The other, the "cloth mother," was constructed of wire but covered in foam rubber and cuddly terry cloth (see Figure 3.1). At the time, many psychologists thought that babies become attached to their mothers simply because mothers provide food (Blum, 2002). But the Harlows' baby monkeys ran to the terry-cloth mother when they were frightened or startled, and snuggling up to it calmed them down. Human children also seek contact comfort when they are in an unfamiliar situation, are scared by a nightmare, or fall and hurt themselves.  **Watch**

Separation and Security Once babies are emotionally attached to the mother or other caregiver, separation can be a wrenching experience. Between 6 and 8 months of age, babies become wary or fearful of strangers. They wail if they are put in an unfamiliar setting or are left with an unfamiliar person. And they show **separation anxiety** if the primary caregiver temporarily leaves them. This reaction usually continues until the middle of

 **Watch the Video**
Attachment in
Infants on
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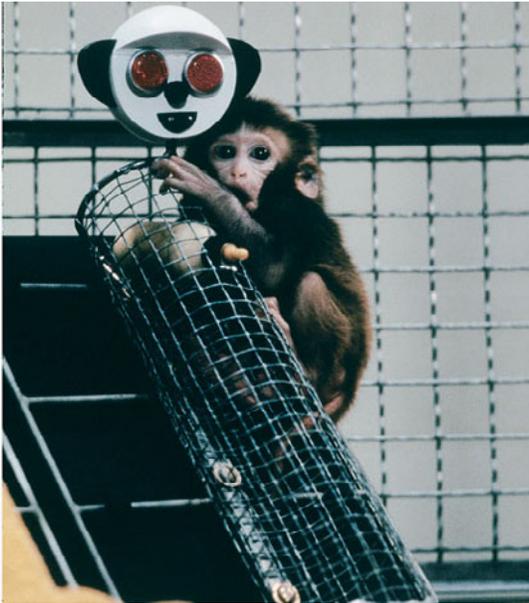


FIGURE 3.1
The Comfort of Contact

Infants need cuddling as much as they need food. In Margaret and Harry Harlow's studies, infant rhesus monkeys were reared with a cuddly terry-cloth "mother" and with a bare-wire "mother" that provided milk (left). The infants would cling to the cuddly mother even when they were not being fed, and they would run to her for comfort when they were frightened.

the second year, but many children show signs of distress until they are about 3 years old (Hrdy, 1999). All children go through this phase, though cultural child-rearing practices influence how strongly the anxiety is felt and how long it lasts. In cultures where babies are raised with lots of adults and other children, separation anxiety is not as intense or as long-lasting as it can be in countries where babies form attachments primarily or exclusively with the mother (Rothbaum et al., 2000).

To study the nature of the attachment between mothers and babies, Mary Ainsworth (1973, 1979) devised an experimental method called the *Strange Situation*. A mother brings her baby into an unfamiliar room containing lots of toys. After a while, a stranger comes in and attempts to play with the child. The mother leaves the baby with the stranger. She then returns and plays with the child, and the stranger leaves. Finally, the mother leaves the baby alone for three minutes and returns. In each case, observers carefully note how the baby behaves with the mother, with the stranger, and when the baby is alone.

Ainsworth divided children into three categories on the basis of their reactions to the Strange Situation. Some babies are *securely attached*: They cry or protest if the parent leaves the room; they welcome her back and then play happily again; they are clearly more attached to the mother than to the stranger. Other babies are *insecurely attached*, and this insecurity can take two forms. The child may be *avoidant*, not caring if the mother leaves the room, making little effort to seek contact with her

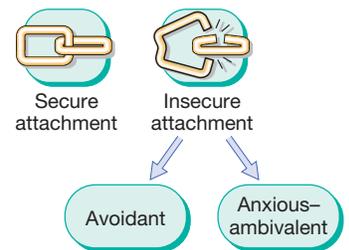
on her return, and treating the stranger about the same as the mother. Or the child may be *anxious or ambivalent*, resisting contact with the mother at reunion but protesting loudly if she leaves. Anxious-ambivalent babies may cry to be picked up and then demand to be put down, or they may behave as if they are angry with the mother and resist her efforts to comfort them.

What Causes Insecure Attachment?

Ainsworth believed that the difference between secure, avoidant, and anxious-ambivalent attachment lies primarily in the way mothers treat their babies during the first year. Mothers who are sensitive and responsive to their babies' needs, she said, create securely attached infants; mothers who are uncomfortable with or insensitive to their babies create insecurely attached infants. To many, the implication was that babies needed exactly the right kind of mothering from the very start to become securely attached, and that putting a child in daycare would retard this important development—notions that have caused considerable insecurity among mothers!

Ainsworth's measure of attachment, however, did not take the baby's experience into account. Babies who become attached to many adults, because they live in large extended families or have spent a lot of time with adults in daycare, may seem to be avoidant in the Strange Situation because they don't panic when their mothers leave. But perhaps they have simply learned to be comfortable with strangers. Moreover, although there is a mod-

STYLES OF ATTACHMENT



est correlation between a mother's sensitivity to her child and the security of her child's attachment, this doesn't tell us which causes what, or whether something else causes both sensitivity and secure attachment. Programs designed to help new mothers become less anxious and more attuned to their babies do help some moms become more sensitive, but these programs only modestly affect the child's degree of secure attachment (Bakermans-Kranenburg et al., 2008).

The emphasis on maternal sensitivity also overlooks the fact that most children, all over the world, form a secure attachment to their mothers in spite of wide variations in child-rearing practices (LeVine & Norman, 2008; Mercer, 2006). German babies are frequently left on their own for a few hours at a stretch by mothers who believe that even babies should become self-reliant. And among the Efe of Africa, babies spend about half their time away from their mothers in the care of older children and other adults (Tronick, Morelli, & Ivey, 1992). Yet German and Efe children are not insecure, and they develop as normally as children who spend more time with their mothers.

Likewise, time spent in daycare has no effect on the security of a child's attachment. In a longitudinal study of more than 1,000 children, researchers compared infants who were in child care 30 hours or more a week, from age 3 months to age 15 months, with children who spent fewer than 10 hours a week in child care. The two groups did not differ on any measure of attachment (NICHD Early Child Care Research Network, 2006). (The daycare group also did

better than children at home on measures of social, language, and cognitive development, although some children in daycare were more aggressive and disobedient as well.)

What factors, then, do promote insecure attachment?

- *Abandonment and deprivation in the first year or two of life.* Institutionalized babies are more likely than adopted children to have later problems with attachment, whereas babies adopted before age 1 or 2 eventually become as securely attached as their nonadopted peers (Rutter et al., 2004; van den Dries et al., 2009).
- *Parenting that is abusive, neglectful, or erratic because the parent is chronically irresponsible or clinically depressed.* A South African research team observed 147 mothers with their 2-month-old infants and followed up when the babies were 18 months old. Many of the mothers who had suffered from postpartum depression became either too intrusive with their infants or too remote and insensitive. In turn, their babies were more likely to be insecurely attached at 18 months (Tomlinson, Cooper, & Murray, 2005).
- *The child's own genetically influenced temperament.* Babies who are fearful and prone to crying from birth are more likely to show insecure behavior in the Strange Situation, suggesting that their later insecure attachment may reflect a temperamental predisposition (Belsky et al., 1996; Gillath et al., 2008; Seifer et al., 1996).
- *Stressful circumstances in the child's family.* Infants and young children may temporarily shift from secure to insecure attachment, becoming clingy and fearful of being left alone, if their families are undergoing a period of stress, as during parental divorce or a parent's chronic illness (Belsky et al., 1996; Mercer, 2006).

The bottom line, however, is that infants are biologically disposed to become attached to their caregivers. Normal, healthy attachment will occur within a wide range of cultural, family, and individual variations in child-rearing customs. Although, sadly, things can go wrong in prenatal development and in the first year after birth, the plasticity of the brain and human resilience can often overcome early deprivation or even harm. We will return to the issue of resilience at the end of this chapter, and in "Taking Psychology with You," we will consider other information that might alleviate the anxieties many parents feel about whether they are doing the right thing.

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"Please, Jason. Don't you want to grow up to be an autonomous person?"

Quick Quiz

Are you feeling secure, anxious, or avoidant about quizzes?

1. Name as many potentially harmful influences on fetal development as you can.
2. Melanie is playing happily on a jungle gym at her daycare center when she falls off and badly scrapes her knee. She runs to her caregiver for a consoling cuddle. Melanie seeks _____.
3. A baby left in the Strange Situation does not protest when his mother leaves the room, and he seems to ignore her when she returns. According to Ainsworth, what style of attachment does this behavior reflect?
4. In Item 3, what else besides the child's style of attachment could account for the child's reaction?

Answers:

1. German measles early in pregnancy; exposure to radiation or toxic substances such as lead or mercury; sexually transmitted diseases; the mother's use of cigarettes, alcohol, or other drugs 2. contact comfort 3. insecure (avoidant) 4. the child's own temperament and familiarity with being temporarily left alone

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YOU are about to learn...

- what a language is—and what it allows us to do that other animals cannot.
- the importance of baby talk in the development of language.
- milestones in the development of language.
- innate and learned aspects of acquiring language.

Language Development

Try to read this sentence aloud:

Kamaunawezakusomamanenohayaweweni-
mtuwamaanasana.

Can you tell where one word begins and another ends? Unless you know Swahili, the syllables of this sentence will sound like gibberish.¹

Well, to a baby learning its native tongue, every sentence must be gibberish at first. How, then, does an infant pick out discrete syllables and words from the jumble of sounds in the environment, much less figure out what the words mean? And how is it that in only a few years, children not only understand thousands of words but can also produce and understand an endless number of new word combinations? Is there something special about the human brain that allows a baby to discover how language works? Darwin (1874) thought so: Language, he wrote, is an instinctive ability unique to human beings.

¹*Kama unaweza kusoma maneno haya, wewe ni mtu wa maana sana*, in Swahili, means “If you can read these words, you are a remarkable person.”

To evaluate Darwin's claim, we must first appreciate that a **language** is not just any old communication system; it is a set of rules for combining elements that are inherently meaningless into utterances that convey meaning. The elements are usually sounds, but they can also be the gestures of American Sign Language (ASL) and other manual languages that deaf and hearing-impaired people use. Because of language, we can refer not only to the here and now but also to past and future events, and to things or people who are not present. Language, whether spoken or signed, allows human beings to express and comprehend an infinite number of novel utterances, created on the spot. This ability is critical; except for a few fixed phrases (“How are you?” “Get a life!”), most of the utterances we produce or hear over a lifetime are new.

Many psychologists today believe that an innate facility for language evolved in human beings because it was extraordinarily beneficial (Pinker, 1994). It permitted our prehistoric ancestors to convey precise information about time, space, and events (as in “Honey, are you going on the mammoth hunt today?”) and allowed them to negotiate alliances that were necessary for survival (“If you share your nuts and berries with us, we'll share our mammoth with you”). Language may also have developed because it provides the human equivalent of the mutual grooming that other primates rely on to forge social bonds (Dunbar, 2004; Tomasello, 2008). Just as other primates will clean, stroke, and groom one another for hours as a sign of affection and connection, human friends will sit for hours and chat over coffee. The difference between chimpanzee and human forms of “stroking” is that language allows us to maintain cooperative social relations in ever-larger groups.

language A system that combines meaningless elements such as sounds or gestures to form structured utterances that convey meaning.

From Cooing to Communicating The acquisition of language may begin in the womb. Canadian psychologists tested newborn babies' preference for hearing English or Tagalog (a major language of the Philippines) by measuring the number of times the babies sucked on a rubber nipple while hearing each language alternating during a ten-minute span. Those whose mothers spoke only English during pregnancy showed a clear preference for English by sucking more during the minutes when English was spoken. Those whose bilingual mothers spoke both languages showed equal preference for both languages (Byers-Heinlein, Burns, & Werker, 2010).

Thus, infants are already responsive to the pitch, intensity, and sound of language, and they also react to the emotions and rhythms in voices. When most people speak to babies, their pitch is higher and more varied than usual and their intonation and emphasis on vowels are exaggerated. Adult use of baby talk, which researchers call *parentese*, has been documented all over the world. In fact, adult members of the Shuar, a nonliterate hunter-gatherer culture in South America, can accurately distinguish American mothers' infant-directed speech from their adult-directed speech just by tone (Bryant & Barrett, 2007). Parentese helps babies learn the melody and rhythm of their native language (Fernald & Mazzie, 1991).

In what has to have been one of the most adorable research projects ever, three investigators compared the way mothers spoke to their babies and to pets, which also tend to evoke baby talk. They found that mothers exaggerate vowel sounds for their babies but not for Puffy the poodle or Cuddles the cat, suggesting that parentese is, indeed, a way of helping infants acquire language (Burnham, Kitamura, & Vollmer-Conna, 2002).

By 4 to 6 months of age, babies can often recognize their own names and other words that are regularly spoken with emotion, such as "mommy" and "daddy." They also know many of the key consonant and vowel sounds of their native language and can distinguish such sounds from those of other languages (Kuhl et al., 1992). Then, over time, exposure to the baby's native language reduces the child's ability to perceive speech sounds that do not exist in their own. Thus, Japanese infants can hear the difference between the English sounds *la* and *ra*, but older Japanese

children cannot. Because this contrast does not exist in their language, they become insensitive to it.

Between 6 months and 1 year, infants become increasingly familiar with the sound structure of their native language. They are able to distinguish words from the flow of speech. They will listen longer to words that violate their expectations of what words should sound like and even to sentences that violate their expectations of how sentences should be structured (Jusczyk, 2002). They start to babble, making many ba-ba and goo-goo sounds, endlessly repeating sounds and syllables. At 7 months, they begin to remember words they have heard, but because they are also attending to the speaker's intonation, speaking rate, and volume, they can't always recognize the same word when different people speak it (Houston & Jusczyk, 2003). Then, by 10 months, they can suddenly do it—a remarkable leap forward in only three months. And at about 1 year of age, though the timing varies considerably, children take another giant step: They start to name things. They already have some concepts in their minds for familiar people and objects, and their first words represent these concepts ("mama," "doggie," "truck").

Also at the end of the first year, babies develop a repertoire of symbolic gestures. They gesture to refer to objects (e.g., sniffing to indicate "flower"), to request something (smacking the lips for "food"), to describe objects (raising the arms for "big"), and to reply to questions (opening the palms or shrugging the shoulders for "I don't know"). They clap in response to pictures of things they like. Children whose parents encourage them to use gestures acquire larger vocabularies, have better comprehension, are better listeners, and are less frustrated in their efforts to communicate than children who are not encouraged to use gestures (Goodwyn & Acredolo, 1998; Rowe & Goldin-Meadow, 2009). When babies begin to speak, they continue to gesture along with their words, just as adults often gesture when talking. These gestures are not a substitute for language but are deeply related to its development, as well as to the development of thinking and problem solving (Goldin-Meadow, Cook, & Mitchell, 2009).

One surprising discovery is that babies who are given infant "brain stimulation" videos to look at are actually *slower* at acquiring words than babies who do not watch videos. In a survey of 1,000 parents and their babies, researchers found that for every hour a day that 8- to 16-month-old babies watch one of these videos, they acquire six to eight fewer words than other children (Zimmermann,



Symbolic gestures emerge early!

Christakis, & Meltzoff, 2007). Babies and children whose parents read to them, or even watch videos with them and talk about what they are all seeing, have larger vocabularies.

Between the ages of 18 months and 2 years, toddlers begin to produce words in two- or three-word combinations (“Mama here,” “go ’way bug,” “my toy”). The child’s first combinations of words have been described as **telegraphic speech**. When people had to pay for every word in a telegram, they quickly learned to drop unnecessary articles (*a*, *an*, or *the*) and auxiliary verbs (*is* or *are*). Similarly, the two-word sentences of toddlers omit articles, word endings, auxiliary verbs, and other parts of speech, yet these sentences are remarkably accurate in conveying meaning. Children use two-word sentences to locate things (“there toy”), make demands (“more milk”), negate actions (“no want,” “all gone milk”), describe events (“Bambi go,” “hit ball”), describe objects (“pretty dress”), show possession (“Mama dress”), and ask questions (“where Daddy?”). Pretty good for a little kid, don’t you think?

By the age of 6, the average child has a vocabulary of between 8,000 and 14,000 words, meaning that children acquire several new words a day between the ages of 2 and 6. (When did you last learn and use five new words in a day?) They absorb new words as they hear them, inferring their meaning from their knowledge of grammatical contexts and from the social contexts in which they hear the words used (Golinkoff & Hirsh-Pasek, 2006; Rice, 1990). (Table 3.1 summarizes the early stages of language development.) How on earth do children do all this?

The Innate Capacity for Language At one time, most psychologists assumed that children

acquired language by imitating adults and paying attention when adults corrected their mistakes. Then along came linguist Noam Chomsky (1957, 1980), who argued that language was far too complex to be learned bit by bit, as one might learn a list of world capitals.

The task facing children, said Chomsky, is far more complicated than merely figuring out which sounds form words. They must also take the *surface structure* of a sentence—the way the sentence is actually spoken or signed—and apply grammatical rules (*syntax*) to infer an underlying *deep structure*, or how the sentence is to be understood. Although “Mary kissed John” and “John was kissed by Mary” have different surface structures, any 5-year-old knows that the two sentences have essentially the same deep structure, in which Mary is the actor and John gets the kiss.

Because no one actually teaches us grammar when we are toddlers, said Chomsky, the human brain must contain an innate mental module that allows young children to develop language if they are exposed to an adequate sampling of conversation. Children are born with a *universal grammar*—that is, their brains are sensitive to the core features common to all languages, such as nouns and verbs, subjects and objects, and negatives. These common features occur even in languages as seemingly different as Mohawk and English, or Okinawan and Bulgarian (Baker, 2001; Cinque, 1999; Pesetsky, 1999). In English, even 2-year-olds use syntax to help them acquire new verbs in context: They understand that “Jane blicked the baby!” involves two people, but the use of the same verb in “Jane blicked!” involves only Jane (Yuan & Fisher, 2009).  **Watch**

telegraphic speech A child’s first word combinations, which omit (as a telegram did) unnecessary words.

 **Watch the Video Bilingual Education on mypsychlab.com**

TABLE 3.1

The Early Development of Language

First few months	Babies cry and coo; they respond to emotions and rhythms in voices.
4–6 months	Babies begin to recognize key vowel and consonant sounds of their native language.
6 months–1 year	Infants’ familiarity with the sound structure of their native language increases; they can distinguish words from the flow of speech.
End of first year	Infants start to name things based on familiar concepts and use symbolic gestures to communicate.
18–24 months	Children begin to speak in two- and three-word phrases (telegraphic speech) and understand verbs from the context in which they occur.
2–6 years	Children rapidly acquire new words, inferring their meaning from the grammatical and social contexts in which they hear them.

Over the years, researchers who study language have gathered much evidence to support the Chomskyan position:

1 Children in different cultures go through similar stages of linguistic development. For example, they will often form their first negatives simply by adding *no* or *not* at the beginning or end of a sentence (“No get dirty”). At a later stage, they will use double negatives (“He don’t want no milk”; “Nobody don’t like me”), even when their language does not allow such constructions (Klima & Bellugi, 1966; McNeill, 1966).

2 Children combine words in ways that adults never would. They reduce a parent’s sentences (“Let’s go to the store!”) to their own two-word versions (“Go store!”) and make many charming errors that an adult would not (“The alligator goed kerplunk,” “Daddy taked me,” “Hey, Horton heard a Who”) (Ervin-Tripp, 1964; Marcus et al., 1992). Such errors, which psycholinguists call *overregularizations*, are not random; they show that the child has grasped a grammatical rule (add the *t* or *d* sound to make a verb past tense, as in *walked* and *bugged*) and is merely overgeneralizing it (*taked*, *goed*).

3 Adults do not consistently correct their children’s syntax, yet children learn to speak or sign correctly anyway. Learning explanations of language acquisition assume that children are rewarded for saying the right words and are punished for making errors. But parents do not stop to correct every error in their children’s speech, so long as they can understand what the child is trying to say (Brown, Cazden, & Bellugi, 1969). Indeed, parents often *reward* children for incorrect statements! The 2-year-old who says “Want milk!” is likely to get it; most parents would not wait for a more grammatical (or polite) request.



These deaf Nicaraguan children have invented their own grammatically complex sign language, one that is unrelated to Spanish or to any conventional gestural language.

4 Children who are not exposed to adult language may invent a language of their own. Deaf children who have never learned a standard language, either signed or spoken, have made up their own sign languages out of thin air. These languages often show similarities in sentence structure across cultures as varied as America, Taiwan, Spain, and Turkey (Goldin-Meadow, 2003). The most astounding case comes from Nicaragua, where a group of deaf children, attending special schools, created a homegrown but grammatically complex sign language that is unrelated to Spanish (Senghas, Kita, & Özyürek, 2004).

5 Infants as young as 7 months can derive simple linguistic rules from a string of sounds. If babies are repeatedly exposed to artificial sentences with an ABA pattern, such as “Ga ti ga” or “Li na li,” until they get bored, they will then prefer new sentences with an ABB pattern (such as “Wo fe fe”) over new sentences with an ABA pattern (such as “Wo fe wo”). (They indicate this preference by looking longer at a flashing light associated with the novel pattern than one associated with the familiar pattern.) Conversely, when the original sentences have an ABB structure, babies will prefer novel ones with an ABA structure. To many researchers, these responses suggest that babies can discriminate the different types of structures (Marcus et al., 1999). Astonishingly, this ability emerges even before they can understand or produce any words.



Even when parents try to correct their children’s syntax, it usually doesn’t work.

The Influence of Learning on Language Although there are commonalities in language acquisition around the world,

there are also some major differences that do not seem explainable by a universal grammar (Gopnik, Choi, & Bamberger, 1996). Many researchers therefore give experience at least as great a role in language development. They argue that instead of inferring grammatical rules because of an innate disposition to do so, children learn the *probability* that any given word or syllable will follow another, something infants as young as 8 months are able to do (Seidenberg, MacDonald, & Saffran, 2002). In this view, infants are more like statisticians than grammarians, and their “statistics” are based on experience (Gerken, Wilson, & Lewis, 2005; Lany & Gómez, 2008).

Using computers, some theorists have been able to design mathematical models of the brain that can acquire some aspects of language, such as regular and irregular past-tense verbs, without the help of a preexisting mental module or preprogrammed rules. These computer programs simply adjust the connections among hypothetical neurons in response to incoming data, such as repetitions of a word in its past-tense form. The success of these computer models, say their designers, suggests that children, too, may be able to acquire linguistic features without getting a head start from

inborn brain modules (Rodriguez, Wiles, & Elman, 1999).

Even theorists who emphasize an inborn grammatical capacity acknowledge that in any behavior as complex as language, nurture must also play a role. Although most children have the capacity to acquire language from mere exposure to it, parents do help things along. They may not go around correcting their children’s speech all day, but they do recast and expand their children’s clumsy or ungrammatical sentences (“Monkey climbing!” “Yes, the monkey is climbing the tree”). Children, in turn, often imitate those recasts and expansions, suggesting that they are learning from them (Bohannon & Symons, 1988).

Language development, therefore, depends on both biological readiness and social experience. Abused children who are not exposed to language during their early years (such as Genie, whom we mentioned in Chapter 1), rarely speak normally or catch up grammatically. Such sad evidence suggests a critical period in language development during the first few years of life or possibly the first decade. During these years, children need exposure to language and opportunities to practice their emerging linguistic skills in conversation with others.

Quick Quiz

Use your human capacity for language to answer these questions.

1. The central distinction between human language and other communication systems is that language (a) allows for the generation of an infinite number of new utterances, (b) is spoken, (c) is learned only after explicit training, (d) expresses meaning directly through surface structures.
2. In Chomsky’s view, why are children able to acquire language as quickly and easily as they do?
3. What five findings support the existence of an innate universal grammar?
4. Those who reject Chomsky’s ideas believe that instead of figuring out grammatical rules when acquiring language, children learn _____.

Answers:

1. a 2. An innate mental module permits young children to develop language if they are exposed to an adequate sampling of conversation. 3. Children everywhere go through similar stages of linguistic development; children combine words in ways that adults would not; adults do not consistently correct their children’s syntax; groups of children not exposed to adult language may make up their own; and even infants only a few months old appear to distinguish different sentence structures. 4. the probability that any given word or syllable will follow another one.

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YOU are about to learn...

- Piaget’s stages of cognitive development and their hallmarks.
- modern approaches to children’s mental development.

Cognitive Development

Children do not think the way adults do. For most of the first year of life, if something is out of sight, it’s out of mind: If you cover a baby’s favorite rattle with a cloth, the baby thinks the rattle has vanished and stops looking for it. And a 4-year-old may protest that a



This child is not intentionally trying to drive his parents crazy. Like a good little scientist, he is trying to figure out cause and effect: “If I throw this dish, what will happen? Will there be a noise? Will mom come and give it back to me? How many times will she give it back to me?”

object permanence

The understanding, which develops throughout the first year, that an object continues to exist even when you cannot see it or touch it.

conservation The understanding that the physical properties of objects—such as the number of items in a cluster or the amount of liquid in a glass—can remain the same even when their form or appearance changes.

sibling has more fruit juice when it is only the shapes of the glasses that differ, not the amount of juice.

Yet children are smart in their own way. Like good little scientists, children are always testing their child-sized theories about how things work (Gopnik, 2009; Gopnik, Meltzoff, & Kuhl, 1999). When your toddler throws her spoon on the floor for the sixth time as you try to feed her, and you say, “That’s enough! I will *not* pick up your spoon again!” the child will immediately test your claim. Are you serious? Are you angry? What will happen if she throws the spoon again? She is not doing this to drive you crazy. Rather, she is learning that her desires and yours can differ, and that sometimes those differences are important and sometimes they are not.

How and why does children’s thinking change? In the 1920s, Swiss psychologist Jean Piaget [Zhan Pee-ah-ZHAY] (1896–1980) proposed that children’s cognitive abilities unfold naturally, like the blooming of a flower, almost independent of what else is happening in their lives. Piaget’s keen observations of children caused a revolution in thinking about how thinking develops. Piaget’s great insight was that children’s errors are as interesting as their correct responses. Children will say things that seem cute or wildly illogical to adults, but the strategies that children use to think and solve problems, said Piaget, are not random or meaningless. They reflect a predictable interaction between the child’s maturational stage and the child’s experience in the world. Although many of Piaget’s specific conclusions have been rejected or modified over the years, his ideas inspired thousands of studies by investigators all over the world.

Piaget’s Theory of Cognitive Stages

According to Piaget (1929/1960, 1984), as children develop, their minds constantly adapt to new situations and experiences. Sometimes they *assimilate* new information into their existing mental categories; thus a German shepherd and a terrier both fit the category *dogs*. At other times, however, children must change their mental categories to *accommodate* their new experiences; a cat does not belong to the category *dogs* and a new category is required, one for *cats*. Both processes are constantly

interacting, Piaget said, as children go through four stages of cognitive development:

From birth to age 2, said Piaget, babies are in the *sensorimotor stage*. In this stage, the infant learns through concrete actions: looking, touching, putting things in the mouth, sucking, grasping. “Thinking” consists of coordinating sensory information with bodily movements. Gradually, these movements become more purposeful as the child explores the environment and learns that specific movements will produce specific results. Pulling a cloth away will reveal a hidden toy; letting go of a fuzzy toy duck will cause it to drop out of reach; banging on the table with a spoon will produce dinner (or Mom, taking away the spoon).

A major accomplishment at this stage, said Piaget, is **object permanence**, the understanding that something continues to exist even when you can’t see it or touch it. In the first few months, infants will look intently at a little toy, but if you hide it behind a piece of paper, they will not look behind the paper or make an effort to get the toy. By about 6 months of age, however, infants begin to grasp the idea that the toy exists whether or not they can see it. If a baby of this age drops a toy from her playpen, she will look for it; she also will look under a cloth for a toy that is partially hidden. By 1 year of age, most babies have developed an awareness of the permanence of objects; even if a toy is covered by a cloth, it must be under there. This is when they love to play peekaboo. Object permanence, said Piaget, represents the beginning of the child’s capacity to use mental imagery and symbols. The child becomes able to hold a concept in mind, to learn that the word *fly* represents an annoying, buzzing creature and that *Daddy* represents a friendly, playful one.

From about ages 2 to 7, the child’s use of symbols and language accelerates. Piaget called this the *preoperational stage*, because he believed that children still lack the cognitive abilities necessary for understanding abstract principles and mental operations. An operation is a train of thought that can be run backward or forward. Multiplying 2 times 6 to get 12 is an operation; so is the reverse operation, dividing 12 by 6 to get 2. A preoperational child knows that Jessie is his sister, but he may not get the reverse operation, the idea that he is Jessie’s brother. Piaget also believed (mistakenly, as we will see) that preoperational children cannot take another person’s point of view because their thinking is *egocentric*: They see the world only from their own frame of reference and cannot imagine that others see things differently.

Further, said Piaget, preoperational children cannot grasp the concept of **conservation**, the



FIGURE 3.2
Piaget's Principle of Conservation

In a typical test for conservation of number (left), the number of blocks is the same in two sets, but those in one set are then spread out and the child must say whether one set has more blocks than another. Preoperational children think that the set that takes up more space has more blocks. In a test for conservation of quantity (right), the child is shown two short glasses with equal amounts of liquid. Then the contents of one glass are poured into a tall, narrower glass, and the child is asked whether one container now has more. Most preoperational children do not understand that pouring liquid from a short glass into a taller one leaves the amount of liquid unchanged. They judge only by the height of liquid in the glass.

notion that physical properties do not change when their form or appearance changes. Children at this age do not understand that an amount of liquid or a number of blocks remains the same even if you pour the liquid from one glass to another of a different size or if you stack the blocks (see Figure 3.2). If you pour liquid from a short, fat glass into a tall, narrow glass, preoperational children will say there is more liquid in the second glass. They attend to the appearance of the liquid (its height in the glass) to judge its quantity, and so they are misled.

From the ages of 7 to about 12, Piaget said, children increasingly become able to take other people's perspectives and they make fewer logical errors. Piaget called this the *concrete operations* stage because he thought children's mental abilities are tied to information that is concrete, that is, to actual experiences that have happened or concepts that have a tangible meaning to them. Children at

this stage make errors of reasoning when they are asked to think about abstract ideas such as "patriotism" or "future education." During these years, nonetheless, children's cognitive abilities expand rapidly. They come to understand the principles of conservation, reversibility, and cause and effect. They learn mental operations, such as addition, subtraction, multiplication, and division. They are able to categorize things (e.g., oaks as trees) and to order things serially from smallest to largest, lightest to darkest, and shortest to tallest.

Finally, said Piaget, beginning at about age 12 or 13 and continuing into adulthood, people become capable of abstract reasoning and enter the *formal operations* stage. They are able to reason about situations they have not experienced firsthand, and they can think about future possibilities. They are able to search systematically for answers to problems. They are able to draw logical conclusions from premises common to their culture and experience.

Get Involved! A Test of Conservation

If you know any young children, try one of Piaget's conservation experiments. A simple one is to make two rows of seven buttons or pennies, aligned identically. Ask the child whether one row has more. Now simply spread out the buttons in one of the rows, and ask the child again whether one row has more. If the child says, "Yes," ask which one and why. Try to do this experiment with a 3-year-old and a 7- or 8-year-old. You will probably see a big difference in their answers.

Current Views of Cognitive Development

Piaget was a brilliant observer of children, and his major point has been well supported: New reasoning abilities depend on the emergence of previous ones. You cannot learn algebra before you can count, and you cannot learn philosophy before you understand logic. But since Piaget's original work, the field of developmental psychology has undergone an explosion of imaginative research that has allowed investigators to get into the minds of even the youngest infants. The result has been a modification of Piaget's ideas, and some scientists go so far as to say that his ideas have been overturned. Here's why.

1 Cognitive abilities develop in continuous, overlapping waves rather than discrete steps or stages. If you observe children at different ages, as Piaget did, it will seem that they reason differently. But if you study the everyday learning of children at any given age, you will find that a child may use several different strategies to solve a problem, some more complex or accurate than others (Siegler, 2006). Learning occurs gradually, with retreats to former ways of thinking as well as advances to new ones. Children's reasoning ability also depends on the circumstances—who is asking them questions, the specific words used, and what they are reasoning about—and not just on the stage they are in. In short, cognitive development is *continuous*; new abilities do not simply pop up when a child turns a specific age (Courage & Howe, 2002).

2 Preschoolers are not as egocentric as Piaget thought. Most 3- and 4-year-olds *can* take another person's perspective (Flavell, 1999). When 4-year-olds play with 2-year-olds, they modify and simplify their speech so the younger children will understand (Shatz & Gelman, 1973). One preschooler we know showed her teacher a picture she had drawn of a cat and an unidentifiable blob. "The cat is lovely," said the teacher, "but what is this thing here?" "That has nothing to do with you," said the child. "That's what the *cat* is looking at."

By about ages 3 to 4, children also begin to understand that you cannot predict what a person will do just by observing a situation or knowing the facts. You also have to know what the person is feeling and thinking; the person might even be lying. They start asking why other people behave as they do ("Why is Johnny so mean?"). In short, they are developing a **theory of mind**, a system of beliefs about how their own and other people's minds work and how people are affected by their beliefs

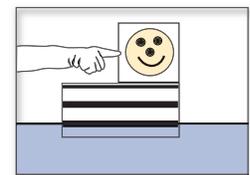
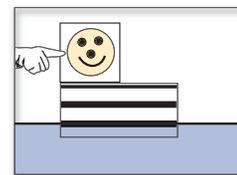
theory of mind A system of beliefs about the way one's own mind and the minds of others work, and of how individuals are affected by their beliefs and feelings.

and emotions. They start using verbs like *think* and *know*, and by age 4 they understand that what another person thinks might not match their own beliefs (Flavell, 1999; Wellman, Cross, & Watson, 2001). The ability to understand that people can have false beliefs is a milestone, because it means the child is beginning to question how we know things—the foundation for later higher-order thinking.

3 Children, even infants, reveal cognitive abilities much earlier than Piaget believed possible. Taking advantage of the fact that infants look longer at novel or surprising stimuli than at familiar ones, psychologists have designed delightfully innovative methods of testing what babies know. These methods reveal that babies may be born with mental modules or core knowledge systems for numbers, spatial relations, the properties of objects, and other features of the physical world (Izard et al., 2009; Spelke & Kinzler, 2007).

For example, at only 4 months of age, babies will look longer at a ball if it seems to roll through a solid barrier, leap between two platforms, or hang in midair than they do when the ball obeys the laws of physics. This suggests that the unusual event is surprising to them (see Figure 3.3). Infants as young as 2½ to 3½ months are aware that objects continue to exist even when masked by other

Possible event



Impossible event

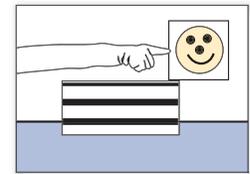
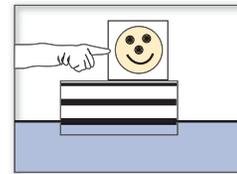


FIGURE 3.3

Testing Infants' Knowledge

In this clever procedure, a baby watches as a box is pushed from left to right along a striped platform. The box is pushed until it reaches the end of the platform (a possible event) or until only a bit of it rests on the platform (an impossible event). Babies look longer at the impossible event, suggesting that it surprises them. Somehow they know that an object needs physical support and can't just float on air (Baillargeon, 1994).

objects, a form of object permanence that Piaget never imagined possible in babies so young (Bailargeon, 2004). And, most devastating to Piaget’s notion of infant egocentrism, even 5-month-old infants are able to perceive other people’s actions as being intentional; they detect the difference between a person who is reaching for a toy with her hand rather than accidentally touching it with a stick (Woodward, 2009). Even 3-month-old infants can learn this!

4 Cognitive development is influenced by a child’s culture. Culture—the world of tools, language, rituals, beliefs, games, and social institutions—shapes and structures children’s cognitive development, fostering some abilities and not others (Tomasello, 2000). Nomadic hunters excel in spatial abilities, because spatial orientation is crucial for finding water holes and successful hunting routes. In contrast, children who live in settled agricultural communities, such as the Baoulé of the Ivory Coast, develop rapidly in the ability to quantify but much more slowly in spatial reasoning.



Experience and culture influence cognitive development. Children who work with clay, wood, and other materials, such as this young potter in India, tend to understand the concept of conservation sooner than children who have not had this kind of experience.

Despite these modifications, Piaget left an enduring legacy: the insight that children are not passive vessels into which education and experience are poured. Children actively interpret their worlds, using their developing abilities to assimilate new information and figure things out.

Quick Quiz

Please use language (and thought) to answer these questions.

1. “More cake!” and “Mommy come” are examples of _____ speech.
2. Understanding that two rows of six pennies are equal in number, even if one row is flat and the other is stacked up, is an example of _____.
3. Understanding that a toy exists even after Mom puts it in her purse is an example of _____.
4. A 5-year-old boy who tells his dad that “Sally said she saw a bunny but she was lying” has developed a _____.
5. List four findings from contemporary research on children’s cognitive development that have expanded or modified Piaget’s theory.

Answers:

1. telegraphic 2. conservation 3. object permanence 4. theory of mind 5. The changes from one stage to another occur in continuous, overlapping waves rather than distinct stages. Children are less egocentric than Piaget thought. Infants and young children reveal cognitive abilities much earlier than Piaget believed possible. And cognitive development is affected by cultural practices and experiences.

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YOU are about to learn...

- how moral feelings and behavior develop.
- why shouting “Because I say so!” does not get most children to behave well.
- the importance of a child’s ability to delay gratification.

Moral Development

How do children learn to tell right from wrong, resist the temptation to behave selfishly, and obey the rules of social conduct? In the 1960s, Lawrence Kohlberg (1964), inspired by Piaget’s work, argued that children’s ability to understand right from



How do children internalize moral rules? How do they learn that cheating, stealing, and grabbing a younger sibling's toy are wrong?

power assertion A method of child rearing in which the parent uses punishment and authority to correct the child's misbehavior.

wrong evolved along with the rest of their cognitive abilities, progressing through three levels. In studies of how children reason about moral dilemmas, he found that very young children obey rules because they fear being punished if they disobey, and later because they think it is in their best interest to obey. At about age 10, their moral judgments shift to ones based on conformity and loyalty to others, and then to an understanding of the rule of law. In adulthood, a few individuals go on to develop a moral standard based on universal human rights: Martin Luther King, Jr. fought against laws supporting segregation, Mohandas Gandhi advocated nonviolent solutions to

injustice in India, and Susan B. Anthony fought for women's right to vote.

Kohlberg was right that moral reasoning ability increases during the school years. Unfortunately, so do cheating, lying, cruelty, and the cognitive ability to rationalize these actions. As Thomas Lickona (1983) wryly summarized, "We can reach high levels of moral reasoning, and still behave like scoundrels." Accordingly, developmental psychologists today place greater emphasis on how children learn to regulate their own emotions and behavior (Mischel & Ayduk, 2004). Most children learn to inhibit their wishes to beat up their younger siblings, steal a classmate's toy, or scream at the top of their lungs if they don't get their way. The child's emerging ability to understand right from wrong, and to behave accordingly, depends on the emergence of conscience and moral emotions such as shame, guilt, and empathy (Kochanska et al., 2005).

As we saw in discussing criticisms of Piaget's theory, even very young children are capable of feeling empathy for others and taking another person's point of view. Children do not obey rules only because they are afraid of what will happen to them if they disobey, but also because they understand right from wrong. By age 5, they know it is wrong to hurt someone even if a teacher tells them to (Turiel, 2002). Therefore, many psychologists conclude that the capacity for understanding right from wrong, like that for language, is inborn. Jerome Kagan (1984) wrote, "Without this fundamental human capacity, which nineteenth-century observers called a *moral sense*, the child could not be

socialized." Evolutionary psychologists argue that this moral sense underlies the basic beliefs, judgments, and behavior that are considered moral almost everywhere, and that it originated in cooperative, altruistic strategies that permitted our forbears to resolve conflicts and get along (Krebs, 2008).

Can the moral sense and the desire to behave well with others be nurtured or extinguished by specific methods of child rearing? For decades, most developmental psychologists assumed that the answer was "Of course!" and they set about trying to pinpoint which parental techniques create well-behaved, kind, unselfish children. Then came a flood of behavioral-genetic studies that led to a very different assumption: The effects of the parents' methods depend—of course!—on the kind of child they have. Does the child heed discipline or become more resistant and hostile? Is the child easygoing or difficult?

Today, many researchers are seeking a middle ground by studying gene-environment interactions (Schmidt et al., 2009). One controversial hypothesis suggests that infants and toddlers who show high levels of distress and irritability are actually more responsive to, and influenced by, styles of parenting than easygoing babies are. When temperamentally difficult babies have impatient, rejecting, or coercive parents, they later tend to become aggressive and even more difficult and defiant. When they have patient, supportive, firm parents, they become better-natured and happier. In contrast, easygoing babies may not benefit as much from good parenting nor suffer as much from bad parenting because they are, well, easygoing (Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2007; Belsky & Pluess, 2009a).

Keeping the complexity of this issue in mind, let's look at how parental discipline methods interact with a child's temperament in the development of conscience and moral behavior.

Getting Children to be Good When you did something wrong as a child, did the adults in your family spank you, shout at you, threaten you, or explain the error of your ways? One of the most common methods that parents use to enforce moral standards and good behavior is **power assertion**, which includes threats, physical punishment, depriving the child of privileges, and generally taking advantage of being bigger, stronger, and more

Thinking Critically
about Assumptions
about Childrearing





Power assertion is the use of physical force, threats, insults, or other kinds of power to get the child to obey (“Do it because I say so!” “Stop that right now!”). The child may obey, but only when the parent is present, while feeling resentful and waiting for the chance to misbehave again.

powerful. Of course, a parent may have no alternative other than “Do it because I say so!” if the child is too young to understand a rule or impishly keeps trying to break it. Moreover, the culture and context in which the discipline occurs makes an enormous difference. Is the parent–child relationship fundamentally loving and trusting or one full of hostility and fighting? Does the child interpret the parents’ actions as being fair and caring, or unfair and cruel?

But when power assertion consists of sheer parental bullying, cruel insults (“You are so stupid, I wish you’d never been born”), and frequent physical punishment, it is associated with greater aggressiveness in children and reduced empathy (Alink et al., 2009; Gershoff, 2002; Moore & Pepler, 2006). As we discuss in Chapter 9, physical punishment often backfires, especially when it is used inappropriately or harshly; it spirals out of control, causing the child to become angry and resentful. Moreover, harsh but ineffective discipline methods are often transmitted to the next generation: Aggressive parents teach their children that the way to discipline children is by behaving aggressively (Capaldi et al., 2003).

What is the alternative? In contrast to power assertion, a parent can use **induction**, appealing to the child’s own abilities, empathy, helpful nature, affection for others, and sense of responsibility (“You made Doug cry; it’s not nice to bite”; “You must never poke anyone’s eyes because that could hurt them seriously”). Or the parent might appeal to the child’s own helpful inclinations (“I know you’re a person who likes to be nice to others”) rather than citing external reasons to be



The parent who uses induction appeals to the child’s good nature, empathy, love for the parent, and sense of responsibility to others and offers explanations of rules (“You’re too grown up to behave like that”; “Fighting hurts your little brother”). The child tends to internalize reasons for good behavior.

good (“You’d better be nice or you won’t get dessert”).

Self-Control and Conscience One of the most important social-emotional skills that children need to acquire is *self-regulation*, the ability to suppress their initial wish to do something in favor of doing something else that is not as much fun. This ability predicts a child’s ability to delay gratification now for a larger reward later, control negative emotions, pay attention to the task at hand, and do well in school, from kindergarten to college (Eigsti et al., 2006; Ponitz et al., 2009).

To explore the links between parental discipline, the child’s self-regulation, and the emergence of conscience, two psychologists conducted a longitudinal study of 106 children at ages 22, 33, and 45 months (Kochanska & Knaack, 2003). When the children were 56 and 73 months old, the researchers measured the development of conscience by giving the children a series of charming tests disguised as games. Some of the games required the child to whisper instead of shout, walk instead of run, ignore the dominant image in a picture and find a more subtle one, and delay gratification by not reaching immediately for candy under a cup or by resisting the urge to open a bag to get out a toy. The researchers also observed what the mothers did when they were asked to get their child to clean up the play area or to prevent the child from playing with some appealing, easily accessible toys. Did the mother explain the reasons for her request to the child (induction) or did she issue strict orders (power assertion)? After interacting with her child, the mother left the room, and the child was free to

induction A method of child rearing in which the parent appeals to the child’s own resources, abilities, sense of responsibility, and feelings for others in correcting the child’s misbehavior.



Children's ability to regulate their impulses and delay gratification are important milestones in the development of conscience and moral behavior.

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obey or disobey. The researchers observed what the child did in her absence.

When the children were 56 months old, the researchers assessed the children's conscience in several moral realms, including being willing to apologize, feeling empathy, being concerned about others' wrongdoing, feeling guilty after doing something naughty or wrong, and being concerned about their parents' feelings. The researchers also measured the children's actual behavior, such as whether they cheated on the rules in playing a ball-tossing game. Then the researchers devised a composite conscience score for each child. Finally, when the

children were 73 months old, their mothers rated them on the frequency of antisocial problems such as being irritable and quick to fly off the handle, destroying their own or others' belongings, or fighting with other children.

The children who were most able to regulate their impulses early in life were the least likely to get in trouble later by fighting or destroying things, and the most likely to have a high conscience score at 56 months of age. Self-regulation was negatively correlated with the mother's use of power assertion, meaning that mothers who ordered their children to "behave" tended to have children who were impulsive and aggressive (see also Alink et al., 2009). But cause and effect worked in both directions: Some mothers relied on power assertion *because* their children were impulsive, defiant, and aggressive and would not listen to them. This pattern of findings teaches us to avoid oversimplification by concluding that "It's all in what the mother does" or that "It's all in the child's personality." Mothers and children, it seems, raise each other.

Quick Quiz

Exercise self-regulation by taking this quiz.

1. What is a major limitation of cognitive theories of moral reasoning in understanding how children develop a conscience?
2. Which method of disciplining a child who is hitting his younger brother is most likely to teach empathy? (a) induction, (b) indulgence, (c) power assertion, (d) spanking
3. What early ability predicts the development of conscience later on?

Answers:

1. Moral behavior is not necessarily related to the ability to reason morally. 2. a 3. self-regulation, the ability to control one's immediate impulses and wishes



YOU are about to learn...

- why some people fail to identify themselves as either male or female.
- the biological explanation of why most little boys and girls are "sexist" in their choice of toys, at least for a while.
- when and how children learn that they are male or female.
- learning explanations of some typical sex differences in childhood behavior.

Gender Development

No parent ever excitedly calls a relative to exclaim, "It's a baby! It's a 7½-pound, black-haired baby!" The baby's sex is the first thing everyone notices and announces. How soon do children notice that boys and girls are different sexes and understand which sex they themselves are? How do children learn the rules of masculinity and femininity, the things that boys do that are different from what girls do? Why, as one friend of ours observed, do most preschool children act like the "gender

police,” insisting, say, that boys can’t be nurses and girls can’t be doctors? And why do some children come to feel they don’t belong to the sex everyone else thinks they do?

Gender Identity

Let’s start by clarifying some terms. **Gender identity** refers to a child’s sense of being male or female, of belonging to one sex and not the other. **Gender typing** is the process of socializing children into their gender roles, and thus reflects society’s ideas about which abilities, interests, traits, and behaviors are appropriately masculine or feminine. A person can have a strong gender identity and not be gender typed: A man may be confident in his maleness and not feel threatened by doing “unmasculine” things such as needlepointing a pillow; a woman may be confident in her femaleness and not feel threatened by doing “unfeminine” things such as serving in combat.

In the past, psychologists often reserved the term *sex* for the physiological or anatomical attributes of males and females, and *gender* for differences that are learned. Today, these two terms are often used interchangeably because, as we have noted repeatedly in this book, nature and nurture are inextricably linked.

The complexity of sex and gender development is especially apparent in the cases of people who do not fit the familiar categories of male and female. Every year, thousands of babies are born with **intersex conditions**, formerly known as hermaphroditism. In these conditions, chromosomal or hormonal anomalies cause the child to be born with

ambiguous genitals, or genitals that conflict with the infant’s chromosomes, and the child becomes “gender variant.” A child who is genetically female might be born with an enlarged clitoris that looks like a penis. A child who is genetically male might be born with androgen insensitivity, a condition that causes the external genitals to appear female.

As adults, many intersexed individuals call themselves *transgender*, a term describing a broad category of people who do not fit comfortably into the usual categories of male and female, masculine and feminine. Some transgender people are comfortable living with the physical attributes of both sexes, considering themselves to be “gender queer” and even refusing to be referred to as he or she. Some feel uncomfortable in their sex of rearing and wish to be considered a member of the other sex. You have probably also heard the term *transsexual*, describing people who are not intersexed yet who feel that they are male in a female body or vice versa; their gender identity is at odds with their anatomical sex or appearance. Many transsexuals try to make a full transition to the other sex through surgery or hormones. Intersexed and transsexual people have been found in virtually all cultures throughout history (Denny, 1998; Roughgarden, 2004).

Influences on Gender Development

To understand the typical course of gender development, as well as the variations, developmental psychologists study the interacting influences of

gender identity The fundamental sense of being male or female; it is independent of whether the person conforms to the social and cultural rules of gender.

gender typing The process by which children learn the abilities, interests, and behaviors associated with being masculine or feminine in their culture.

intersex conditions Conditions in which chromosomal or hormonal anomalies cause a child to be born with ambiguous genitals, or genitals that conflict with the infant’s chromosomes.



Ann Bonny and Mary Read convicted of Piracy Nov. 28th 1720 at a Court of Vice Admiralty held at S. Jago de la Vega in y. Island of Jamaica.



Throughout history and across cultures, there have been people who broke out of conventional gender categories. Some women have lived as men, as did the eighteenth-century pirates Ann Bonny and Mary Read (left). Some men have lived as women: The Muxes (pronounced moo-shays) of Oaxaca, Mexico, are men who consider themselves women, live as women, and are a socially accepted category. Carmelo López Bernal, age 13 (center), first appeared publicly as a female at the annual town-wide muxe celebration. Luke Woodward (right), who was born and raised female, came out as a male, and became active in a campus movement to make life better for fellow transgender students.

biology, cognition, and learning on gender identity and gender typing.

Biological Influences Starting in the preschool years, boys and girls congregate primarily with other children of their sex, and most prefer the toys and games of their own sex. They will play together if required to, but given their druthers, they usually choose to play with same-sex friends. The kind of play that young boys and girls enjoy also differs, on average. Little boys, like young males in all primate species, are more likely than females to go in for physical roughhousing, risk taking, and aggressive displays. These sex differences occur all over the world, almost regardless of whether adults encourage boys and girls to play together or separate them (Lytton & Romney, 1991; Maccoby, 1998, 2002). Many parents lament that although they try to give their children the same toys, it makes no difference; their sons want trucks and guns and their daughters want dolls.

Biological researchers believe that these play and toy preferences have a basis in prenatal hormones, particularly the presence or absence of prenatal androgens (masculinizing hormones). Girls who were exposed to higher-than-normal prenatal androgens in the womb are later more likely than nonexposed girls to prefer “boys’ toys” such as cars and fire engines, and they are also more physically aggressive than other girls (Berenbaum & Bailey, 2003). A study of more than 200 healthy children in the general population also found a relationship between fetal testosterone and play styles. (Testosterone is produced in fetuses of both sexes, although it is higher on average in males.) The

Look familiar? In a scene typical of many nursery schools and homes, the boy builds a gun out of anything he can, and the girl dresses up in any pretty thing she can find. Whether or not such behavior is biologically based, the gender rigidity of the early years does not inevitably continue into adulthood unless cultural rules reinforce it.



higher the levels of fetal testosterone, as measured in the amniotic fluid of the children’s mothers during pregnancy, the higher the children’s later scores on a measure of male-typical play (Auyeung et al., 2009). In studies of rhesus monkeys, who of course are not influenced by their parents’ possible gender biases, male monkeys, like human boys, consistently and strongly prefer to play with wheeled toys rather than cuddly plush toys, whereas female monkeys, like human girls, are more varied in their toy preferences (Hassett, Siebert, & Wallen, 2008).

Do these findings have anything to do with gender identity, the core sense of being male or female? In the past, gender identity was believed to be almost entirely learned, a result of the child’s socialization and learning. Then a widely publicized case study appeared to show that gender identity is hardwired in the brain. At the age of 7 months, a genetically and hormonally male child had lost his penis in a freak accident during a routine surgical procedure. When he was nearly 2 years old, his desperate parents, on the advice of a leading scientist in the field of gender identity, agreed to raise him as a girl, renaming him Brenda. But Brenda preferred boys’ toys and by the age of 14, refused to keep living as a female. Her father told her the truth and, in relief, Brenda turned to a male identity (Diamond & Sigmundson, 1997). He changed his name to David, had reconstructive surgery to build a penis, and, in his 20s, got married. But the story did not end happily. After David’s twin brother, who had schizophrenia, committed suicide, and after David lost his job and separated from his wife, he became deeply depressed. At the age of 38, David killed himself.

Unfortunately, dramatic case studies such as this one cannot really tell us whether gender identity is fixed in the brain prenatally. Perhaps David’s experience was atypical. Perhaps there is a critical period after birth during which gender identity develops. (David’s parents did not decide to raise him as a girl until he was nearly 2 years old.) A psychologist who reviewed hundreds of cases of children whose sex of rearing was discrepant with their anatomical or genetic sex found that the picture is enormously complex: A person’s gender identity depends on the interactions of genes, prenatal hormones, anatomical structures, and experiences in life (Zucker, 1999). As a result, the outcome in any particular case is hard to predict.

**Thinking Critically
about Gender Identity**



Cognitive Influences Cognitive psychologists explain the mystery of children's gender segregation and toy and play preferences by studying children's changing cognitive abilities. Even before babies can speak, they recognize that there are two sexes. By the age of 9 months, most babies can discriminate male from female faces (Fagot & Leinbach, 1993), and they can match female faces with female voices (Poulin-Dubois et al., 1994). By the age of 18 to 20 months, most toddlers have a concept of gender labels; they can accurately identify the gender of people in picture books and begin correctly using the words *boy*, *girl*, and *man* (interestingly, *lady* and *woman* come later) (Zosuls et al., 2009).

Once children can label themselves and others consistently as being a boy or a girl, shortly before age 2, they change their behavior to conform to the category they belong to. Many begin to prefer same-sex playmates and sex-traditional toys without being explicitly taught to do so (Martin, Ruble, & Szkrybalo, 2002; Zosuls et al., 2009). They become more gender typed in their toy play, games, aggressiveness, and verbal skills than children who still cannot consistently label males and females. Most notably, girls stop behaving aggressively (Fagot, 1993). It is as if they go along behaving like boys until they know they are girls. At that moment, they seem to decide: "Girls don't do this; I'm a girl; I'd better not either."

It's great fun to watch 3- to 5-year-old children struggle to figure out what makes boys and girls different: "The ones with eyelashes are girls; boys don't have eyelashes," said one 4-year-old girl to her aunt in explaining her drawing. After dinner at an Italian restaurant, a 4-year-old boy told his parents that he'd got the answer: "Men eat pizza and women don't" (Bjorkland, 2000).

At about age 5, most children develop a stable gender identity, a sense of themselves as being male or female regardless of what they wear or how they behave. Only then do they understand that what boys and girls do does not necessarily indicate what sex they are: A girl remains a girl even if she can climb a tree (or eats a pizza!), and a boy remains a boy even if he has long hair. At this age, children consolidate their knowledge, with all of its mistakes and misconceptions, into a **gender schema**, a mental network of beliefs and expectations about what it means to be male or female and about what each sex is supposed to wear, do, feel, and think (Bem, 1993; Martin & Ruble, 2004). Gender schemas even include metaphors: After age 4, children of both sexes will usually say that rough, spiky, black, or mechanical things are male and that soft, pink, fuzzy, or

flowery things are female; that black bears are male and pink poodles are female (Leinbach, Hort, & Fagot, 1997). Gender schemas are most rigid between ages 5 and 7; at this age, it's really hard to dislodge a child's notion of what boys and girls can do (Martin, Ruble, & Szkrybalo, 2002). A little girl at this stage may tell you stoutly that "girls can't be doctors," even if her own mother is a doctor.

Many people retain inflexible gender schemas throughout their lives, feeling uncomfortable or angry with men or women who break out of traditional roles—let alone with transgendered individuals who don't fit either category or want to change the one they grew up with. However, with experience and cognitive sophistication, older children often become more flexible in their gender schemas, especially if they have friends of the other sex and if their families and cultures encourage such flexibility (Martin & Ruble, 2004). Children begin to modify their gender schemas, understanding that women can be engineers and men can be cooks.

Cultures and religions, too, differ in their schemas for the roles of women and men. In all Western, industrialized nations, it is taken for granted that women and men alike should be educated; indeed, laws mandate a minimum education for both sexes. But in cultures where female education is prohibited in the name of religious law, as in the parts of Afghanistan controlled by the Taliban, many girls who attend school receive death threats and some have had acid thrown on their faces. Gender schemas can be very powerful, and events that challenge their legitimacy can be enormously threatening.



"Jason, I'd like to let you play, but soccer is a girls' game."

gender schema A cognitive schema (mental network) of knowledge, beliefs, metaphors, and expectations about what it means to be male or female.

Get Involved! Gender and Generations

Gender norms have been changing rapidly, and one way to see this for yourself is to interview older members of your family. Ask at least one man and one woman these questions: (1) When you were growing up, was there anything your parents did not permit you to do because of your sex? (2) Is there any job you think is unsuitable for a man or a woman to do? (3) Did you ever experience discrimination because of your sex? Now consider how you would answer those questions. Do your answers agree with theirs? Why or why not?

Shocking images or nothing new? The idea of women serving in the military and men teaching preschoolers would once have startled most people and offended others. As women soldiers became common, they lost the power to shock, at least if they remained in service jobs. But the wars in Iraq and Afghanistan have again changed the gender rules, creating a generation of female soldiers who fight on the front lines with their male peers. In the photo on the left, Staff Sergeant Patricia Bradford and Specialist Jennifer Hoepfner are briefed before going out on patrol in Iraq in 2009.

Learning Influences A third influence on gender development is the environment, which is full of subtle and not-so-subtle messages about what girls and boys are supposed to do. Behavioral and social-cognitive learning theorists study how the process of gender socialization instills these messages in children. They find that gender socialization begins at the moment of birth. Parents tend to portray their newborn girls as more feminine and delicate than boys, and boys as stronger and more athletic than girls, although it is hard to know how athletic a newborn boy could be (Karraker, Vogel, & Lake, 1995). Many parents are careful to dress their baby in outfits they consider to be the correct color and pattern for his or her sex. Clothes don't matter to the infant, of course, but they are signals to adults about how to treat the child. Adults often respond to the same baby differently, depending on whether the child is dressed as a boy or a girl.

Parents, teachers, and other adults convey their beliefs and expectations about gender even when they are entirely unaware that they are doing so. For example, when parents believe that boys are naturally better at math or sports and that girls are naturally better at English, they unwittingly communicate those beliefs by how they respond to a child's success or failure. They may tell a son who did well in math, "You're a natural math whiz, Johnny!" But if a daughter gets good grades, they may say, "Wow, you really worked hard in math, Joanie, and it shows!" The implication is that girls have to try hard but boys have a natural gift. Messages like these are not lost on children. Both sexes tend to lose interest in activities that are supposedly not natural for them, even when they all start out with equal abilities (Dweck, 2006; Frome & Eccles, 1998).

In today's fast-moving world, society's messages to men and women keep shifting. As a result, gender development has become a lifelong



process, in which gender schemas, attitudes, and behavior evolve as people have new experiences and as society itself changes. Five-year-old children may behave like sexist piglets while they are trying to figure out what it means to be male or female. Their behavior is shaped by a combination of hormones, genetics, cognitive schemas, parental and social lessons, religious and cultural customs, and experiences. But their gender-typed behavior as 5-year-olds often has little to do with how they

will behave at 25 or 45. In fact, by early adulthood, men and women show virtually no average differences in cognitive abilities, personality traits, self-esteem, or psychological well-being (Hyde, 2007). Children can grow up in an extremely gender-typed family and yet, as adults, find themselves in careers or relationships they would never have imagined for themselves. If 5-year-olds are the gender police, many adults end up breaking the law.

Quick Quiz

Taking quizzes is appropriate behavior for all sexes and genders.

1. Three-year-old Paulo thinks that if he changed from wearing pants to wearing dresses he could become a girl. He still lacks a stable _____.
2. *True or false:* All intersexed people are transsexual.
3. A biological psychologist would say that a 3-year-old boy's love of going "vroom, vroom" with his truck collection is probably a result of _____.
4. Which statement about gender schemas is *false*? (a) They are present in early form by 1 year of age; (b) they are permanent conceptualizations of what it means to be masculine or feminine; (c) they eventually expand to include many meanings and associations to being male and female; (d) they probably reflect the status of women and men in society.
5. Herb hopes his 4-year-old daughter will become a doctor like him, but she refuses to play with the toy stethoscope he bought her and insists that she will be a princess when she grows up. What conclusions can Herb draw about his daughter's future career?

Answers:

1. gender identity 2. false 3. prenatal hormones, specifically androgen 4. b 5. Not many. His daughter's rigid gender-typed behavior is typical when children are acquiring gender schemas, but it does not necessarily predict much of anything about her adult interests or occupation.

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YOU are about to learn...

- the physiological changes of adolescence.
- the psychological issues of adolescence.
- findings on brain development in adolescence.

Adolescence

Adolescence refers to the period of development between **puberty**, the age at which a person becomes capable of sexual reproduction, and adulthood. In some cultures, the time span between puberty and adulthood is only a few months; a sexually mature boy or girl is expected to marry and assume adult tasks. In modern Western societies, however, teenagers are not considered emotionally mature enough to assume the full rights, responsibilities, and roles of adulthood.

The Physiology of Adolescence

Until puberty, boys and girls produce roughly the same levels of male hormones (androgens) and female hormones (estrogens). At puberty, however, the brain's pituitary gland begins to stimulate hormone production in the adrenal and reproductive glands. From then on, boys have a higher level of androgens than girls do, and girls have a higher level of estrogens than boys do.

The Onset of Puberty In boys, the reproductive glands are the testes (testicles), which produce sperm; in girls, the reproductive glands are the ovaries, which release eggs. During puberty, these organs mature and the individual becomes capable of reproduction. In girls, signs of sexual maturity are the development of breasts and **menarche**, the onset of menstruation. In boys, the

puberty The age at which a person becomes capable of sexual reproduction.

menarche [men-ARR-kee] The onset of menstruation during puberty.



To their embarrassment, children typically reach puberty at different times. These girls are all the same age, but they differ considerably in physical maturity.

 **Watch the Video Adolescent Behavior on mypsychlab.com**

signs are the onset of nocturnal emissions and the growth of the testes, scrotum, and penis. Hormones are also responsible for the emergence of *secondary sex characteristics*, such as a deepened voice and facial and chest hair in boys and pubic hair in both sexes.

The onset of puberty depends on both biological and environmental factors. Menarche depends on a female's

having a critical level of body fat, which is necessary to sustain a pregnancy and which triggers the hormonal changes associated with puberty. An increase in body fat among children in developed countries may help explain why the average age of puberty declined in Europe and North America until the mid-twentieth century. The average age of menarche now occurs at about 12 years and 6 months in white girls and a few months earlier in black girls.

Individuals vary enormously in the onset and length of puberty. Some girls go through menarche at 9 or 10 and some boys are still growing in height after age 19. Early-maturing boys generally have a more positive view of their bodies than late-maturing boys do, and their relatively greater size and strength give them a boost in sports and the prestige that being a good athlete brings young men. But they are also more likely to smoke, drink alcohol, use other drugs, and break the law than later-maturing boys (Cota-Robles, Neiss, & Rowe, 2002; Duncan et al., 1985). Some early-maturing girls have the prestige of being socially popular, but, partly because others in their peer group regard them as being sexually precocious, they are also more likely to fight with their parents, drop out of school, have a negative body image, and be angry or depressed. Early menarche itself does not cause these problems; rather, it tends to accentuate existing behavioral problems and family conflicts. Girls who go through puberty relatively late, in contrast, have a more difficult time at first, but by the end of adolescence, many are happier with their appearance and are more popular than their early-maturing classmates (Caspi & Moffitt, 1991; Stattin & Magnusson, 1990).

Brain Development When people think of physical changes in adolescence, they usually think of hormones and maturing bodies. But the adolescent brain undergoes significant developmental changes, notably a major pruning of neural connections. This pruning occurs primarily in the prefrontal cortex, which is responsible for impulse control and planning, and the limbic system, which is involved in emotional processing (Spear, 2000). In Chapter 11, we will see that errors in the pruning process during adolescence may be involved in the onset of schizophrenia in vulnerable individuals.

Another change involves *myelination*, which provides a fatty sheath of insulation for some cells (see Chapter 4). Myelination strengthens the connections between the emotional limbic system and the reasoning prefrontal cortex. This process may continue through the late teens to the mid-20s, which would help explain why the strong emotions of the adolescent years often overwhelm rational decision making and cause some teenagers to behave more impulsively than adults (Steinberg, 2007). It would explain why adolescents are more vulnerable to peer pressure that encourages them to try risky, dumb, or dangerous things—why taunts of “I dare you!” and “You’re chicken!” have more power over a 15-year-old than a 25-year-old. Even when teenagers know they are doing the wrong thing, many lack the reasoning ability to foresee the consequences of their actions down the line (Reyna & Farley, 2006).  **Watch**

In 2005, the U.S. Supreme Court banned the death penalty for juveniles as cruel and unusual punishment, partly on the basis of evidence showing that adolescents often get into trouble because of the neurological immaturity of their brains (Steinberg, 2007). Some researchers have even concluded that many teenagers who commit crimes should be considered “less guilty by reason of adolescence” (Steinberg & Scott, 2003). Do you agree?

The Psychology of Adolescence

The media love sensational stories about teenagers who are angry, violent, live in emotional turmoil, feel lonely, hate their parents, and are running wild sexually. Tyra Banks and Oprah Winfrey have warned parents about an alleged teenage “sex crisis,” in which teens are having sex at ever-younger ages. Parents and prosecutors are alarmed about “sexting,” the practice of emailing nude pictures to friends. (In ten states so far, this practice has led to 14- and 15-year-olds being arrested on charges of creating and distributing child pornography.) Some observers worry that teenagers have too little

self-esteem, which is why they are forever getting in trouble; others worry that, thanks to the self-esteem movement, teenagers have too much self-esteem. One psychologist argues that today's young people have become so narcissistic that they deserve to be called "Generation Me" (Twenge et al., 2008).

How realistic is this portrait of adolescence? Not very. The rate of violent crimes committed by adolescents has been dropping steadily since 1993. Overall feelings of self-esteem do not suddenly plummet after the age of 13 for either sex (Gentile et al., 2009; Kling et al., 1999). How about overinflated self-esteem? One team of researchers examined large samples of high school seniors surveyed every year from 1976 to 2006 (nearly a half million students). In addition to looking at scores on the Narcissistic Personality Inventory, which measures a grandiose sense of importance and entitlement, they developed another measure of narcissism: unreasonable self-enhancement, the discrepancy between how good you actually are academically and how good you *think* you are. They found very little change in narcissism on either measure over the decades (Trzesniewski, Donnellan, & Robins, 2008). They also found little change over the decades in self-esteem, feelings of control, hopelessness, happiness, life satisfaction, the importance of religion, and many other qualities (Trzesniewski & Donnellan, 2010). All young people are more narcissistic than their elders, other investigators concluded, simply because adolescence and young

adulthood are a developmental stage when people get to think about themselves and their futures, and those

concerns are not particular to "Generation Me" (Roberts, Edmonds, & Grijalva, 2010).

What about sex? According to the National Youth Risk Behavior Survey, today's teenagers are actually more conservative than their parents were at their age. In 1991, 54.1 percent of all high school students had had sex; in 2007, fewer than half (47.8 percent) had ever had sex, and only a third were currently sexually active (Eaton et al., 2008). The number of sexual partners has also declined (Bogle, 2008). Only the rate of births to teenage girls has risen in the past few years, a result of declining contraceptive use.

Similarly, studies of representative samples of adolescents find that only a small minority is seriously troubled, angry, or unhappy. Most teenagers have supportive families, a sense of purpose and self-confidence, good friends, and the skill to cope with their problems. Nevertheless, three kinds of

problems are more common during adolescence than during childhood or adulthood: conflict with parents, mood swings and depression, and, as we saw, higher rates of reckless, rule breaking, and risky behavior (Steinberg, 2007). Rule breaking often

occurs because teenagers are developing their own standards and values, often by trying on the styles, actions, and attitudes of their peers, in contrast to those of their parents.

Peers become especially important to adolescents because they represent the values and style of the generation that teenagers identify with, the generation that they will share experiences with as adults (Bukowski, 2001; Harris, 2009). Many people report that feeling rejected by their peers when they were teenagers was more devastating than punitive treatment by parents. According to a government-sponsored review of whether and how online technologies affect child safety, the most frequent dangers that teenagers face on the Internet are not pornography or even predatory adults, and definitely not sexting. "Bullying and harassment, most often by peers, are the most frequent threats that minors face, both online and offline," the report found (Berkman Center for Internet & Society, 2008).

Adolescents who are lonely, depressed, worried, or angry tend to express these concerns in ways characteristic of their sex. Boys are more likely than girls to externalize their emotional problems in acts of aggression and other antisocial behavior. Girls are more likely than boys to internalize their feelings and problems, by becoming withdrawn or developing eating disorders (Wicks-Nelson & Israel, 2003). Although, as we said, there are no gender differences in overall self-esteem, a gender gap in two specific *areas* of self-esteem emerges in adolescence, reflecting the externalizing/internalizing difference in habits of coping. Girls are more dissatisfied than boys with their bodies and general appearance; boys are more dissatisfied than girls with their social behavior at school and with friends (Gentile et al., 2009).



"So I blame you for everything—whose fault is that?"



**Thinking Critically
about Adolescent
Psychology**



Quick Quiz

If you are not in the midst of adolescent turmoil, try these questions.

1. What is the difference between *puberty* and *adolescence*?
2. Extreme turmoil and rebellion in adolescence are (a) nearly universal, (b) the exception rather than the rule, (c) rare.
3. *True or false:* Teenage boys have much higher self-esteem than teenage girls do.
4. What changes occur in the brain during adolescence?

Answers:

1. Puberty refers to the physiological process of sexual maturation; adolescence is a social category marking the years between puberty and adulthood. 2. b 3. false 4. true
 1. Puberty refers to the physiological process of sexual maturation; adolescence is a social category marking the years between puberty and adulthood. 2. b 3. false 4. true
 1. Puberty refers to the physiological process of sexual maturation; adolescence is a social category marking the years between puberty and adulthood. 2. b 3. false 4. true



YOU are about to learn...

- Erik Erikson's theory of the stages of adult development.
- the typical attitudes and experiences of "emerging adulthood," the years from 18 to 25.
- some common midlife changes for women and men.
- which mental abilities decline in old age and which ones do not.

Adulthood

According to ancient Greek legend, the Sphinx was a monster—half lion, half woman—who terrorized passersby on the road to Thebes. The Sphinx would ask each traveler a question and then murder those who failed to answer correctly. (The Sphinx was a pretty tough grader.) The question was: What animal walks on four feet in the morning, two feet at noon, and three feet in the evening? Only one traveler, Oedipus, knew the solution to the riddle. The animal, he said, is man, who crawls on all fours as a baby, walks upright as an adult, and limps in old age with the aid of a staff.

The Sphinx was the first life span theorist. Since then, many philosophers, writers, and scientists have speculated on the course of adult development. Are the changes of adulthood predictable, like those of childhood? What are the major psychological issues of adult life? Is mental and physical deterioration in old age inevitable?

Stages and Ages

One of the first modern theorists to propose a life span approach to psychological development was psychoanalyst Erik H. Erikson (1902–1994).

Erikson (1950/1963, 1982) wrote that all individuals go through eight stages in their lives. Each stage is characterized by what he called a "crisis," a particular psychological challenge that ideally should be resolved before the individual moves on.

1 Trust versus mistrust is the challenge that occurs during the baby's first year, when the baby depends on others to provide food, comfort, cuddling, and warmth. If these needs are not met, the child may never develop the essential trust of others necessary to get along in the world.

2 Autonomy (independence) versus shame and doubt is the challenge that occurs when the child is a toddler. The young child is learning to be independent and must do so without feeling too ashamed or uncertain about his or her actions.

3 Initiative versus guilt is the challenge that occurs as the preschooler develops. The child is acquiring new physical and mental skills, setting goals, and enjoying newfound talents, but must also learn to control impulses. The danger lies in developing too strong a sense of guilt over his or her wishes and fantasies.

4 Competence versus inferiority is the challenge for school-age children, who are learning to make things, use tools, and acquire the skills for adult life. Children who fail these lessons of mastery and competence may come out of this stage feeling inadequate and inferior.

5 Identity versus role confusion is the great challenge of adolescence, when teenagers must decide who they are, what they are going to do, and what they hope to make of their lives. Erikson used the term *identity crisis* to describe what he considered

to be the primary conflict of this stage. Those who resolve it will emerge with a strong identity, ready to plan for the future. Those who do not will sink into confusion, unable to make decisions.

6 Intimacy versus isolation is the challenge of young adulthood. Once you have decided who you are, said Erikson, you must share yourself with another and learn to make commitments. No matter how successful you are in your work, you are not complete until you are capable of intimacy.

7 Generativity versus stagnation is the challenge of the middle years. Now that you know who you are and have an intimate relationship, will you sink into complacency and selfishness, or will you experience generativity—creativity and renewal? Parenthood is the most common route to generativity, but people can be productive, creative, and nurturant in other ways, in their work or their relationships with the younger generation.

8 Ego integrity versus despair is the final challenge of old age. As they age, people strive to reach the ultimate goals of wisdom, spiritual tranquility, and acceptance of their lives. Just as the healthy child will not fear life, said Erikson, the healthy adult will not fear death.

Erikson recognized that cultural and economic factors affect people's progression through these stages. Some societies make the passages relatively easy. If you know you are going to be a farmer like your parents and you have no alternative, you are unlikely to have an adolescent identity crisis (unless

you hate farming). If you have many choices, however, as adolescents in urban societies often do, the transition can become prolonged (Schwartz, 2004). Similarly, cultures that place a high premium on independence and individualism will make it difficult for many of their members to resolve Erikson's sixth crisis, that of intimacy versus isolation.

Erikson was also aware that the psychological themes and crises of life can occur out of order, although that was not his emphasis. As people's lives became less traditional and predictable, researchers discovered just how out of order they can be. Today, for instance, an identity crisis is no longer limited to the teen years. A man who has worked in one job for 20 years, and then is laid off at 45 and must find an entirely new career, may have an identity crisis too. Likewise, competence is not mastered once and for all in childhood. People learn new skills and lose old ones throughout their lives, and their sense of competence rises and falls accordingly. And people who are highly generative, in terms of being committed to helping their communities or the next generation, tend to do volunteer work or choose occupations that allow them to contribute to society throughout their lives (McAdams, 2006).

Stage theories, therefore, do not adequately describe how adults grow and change, or remain the same, across the life span. Yet Erikson was right to show that development does not stop at adolescence or young adulthood; it is an ongoing process. His ideas were important because he placed adult development in the context of family, work, and society, and he specified many of the timeless and universal concerns of adulthood: trust, competence, identity, generativity, and the ability to enjoy life and accept death (Dunkel & Sefcek, 2009).

The Transitions of Life

Some events tend to occur at particular times in life: going to school, learning to drive a car, having a baby, retiring from work. When nearly everyone your age goes through the same experience or enters a new role at the same time, adjusting to these transitions is relatively easy. Conversely, if you aren't doing these things and hardly anyone you know is doing them either, you will not feel out of step.

In modern societies, however, most people will face unanticipated transitions, events that happen without warning, such as being fired from a job because of downsizing. And many people have to deal with changes that they expect to happen that do not, such as not getting a job right out of college, not getting married at the age they expected, not



According to Erik Erikson, children must master the crisis of competence and older adults must resolve the challenge of generativity. This child and her grandmother are certainly helping each other with their life tasks. But are the needs for competence and generativity important at only one stage of life?

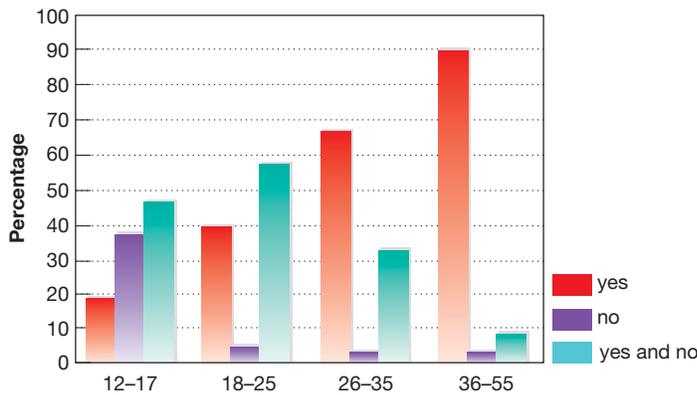


FIGURE 3.4
Are You an Adult Yet?

When people are asked, “Do you feel that you have reached adulthood?” the percentage that answers “yes” steadily increases over time. But as you can see, people between the ages of 18 and 25, emerging adults, are most likely to say “yes and no” (Arnett, 2004).

getting promoted, not being able to afford to retire, or realizing that they cannot have children (Schlossberg & Robinson, 1996). With this in mind, let’s consider some of the major transitions of life.

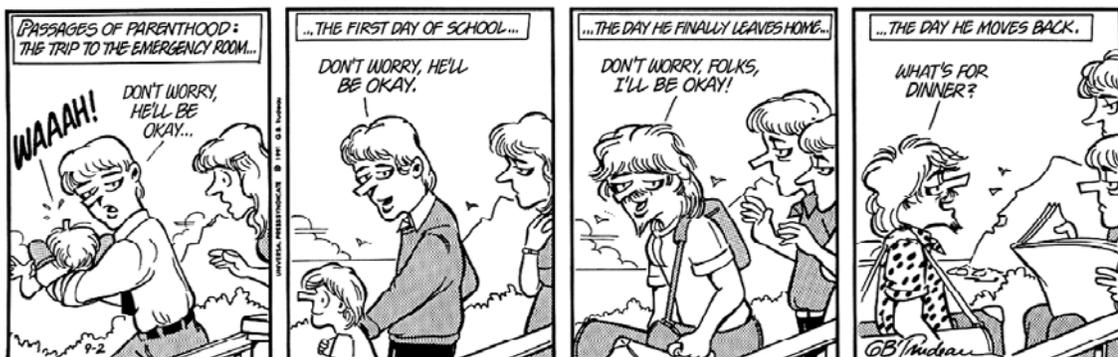
Emerging Adulthood In industrialized nations, major demographic changes have postponed the timing of career decisions, marriage or cohabitation, and parenthood until a person’s late 20s or even 30s, on the average. Many young people between the ages of 18 and 25 are in college and at least partly dependent financially on their parents. This phenomenon has created a phase of life that some call *emerging adulthood* (Arnett, 2004). When emerging adults are asked whether they feel they have reached adulthood, the majority answer “in some ways yes, in some ways no” (see Figure 3.4).

In certain respects, emerging adults have moved beyond adolescence into maturity, becoming more emotionally controlled, more confident, less dependent, and less angry and alienated (Roberts, Caspi, & Moffitt, 2001). But they are also the group most likely to live unstable lives and feel unrooted. Emerging adults move more often than people in other demographic groups do—back to their parents’ homes and then out again, from one city to another, from living with roommates to living on their own. And their rates of risky behavior (such as binge drinking, having unprotected sex, and driving at high speeds or while drunk) are higher than those of any other age group, including adolescents (Arnett, 2004).

Of course, not all young people in this age group are alike. Some groups within the larger society, such as Mormons, promote early marriage and parenthood. And young people who are poor, who have dropped out of school, who had a child at 16, or who have few opportunities to get a good job will not have the income or leisure to explore many options. But the overall shift in all industrialized nations toward a global economy, increased education, and delayed career and family decisions means that emerging adulthood is likely to grow in importance as a distinct phase of prolonged exploration and freedom.

The Middle Years For most women and men, the midlife years between 35 and 65 are the prime of life (MacArthur Foundation, 1999; Mroczek & Sprio, 2005; Newton & Stewart, 2010). These years are typically a time of the greatest well-being, good health, productivity, and community involvement. They are also often a time of reflection and reassessment. People look back on what they have accomplished, take stock of what they regret not having done, and think about what they want to do

Doonesbury



BY GARRY TRUDEAU
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with their remaining years. When crises occur, they are for reasons not related to aging but to specific life-changing events, such as illness or the loss of a job or partner (Wethington, 2000).

But doesn't menopause make most midlife women depressed, irritable, and irrational? **Menopause**, which usually occurs between ages 45 and 55, is the cessation of menstruation after the ovaries stop producing estrogen and progesterone. Menopause does produce physical symptoms in many women, notably hot flashes, as the vascular system adjusts to the decrease in estrogen. But only about 10 percent of all women have unusually severe physical symptoms.

The negative view of menopause as a syndrome that causes depression and other negative emotional reactions is based on women who have undergone early menopause following a hysterectomy (removal of the uterus) or who have had a lifetime history of depression. But these women are not typical. According to many surveys of thousands of healthy, randomly chosen women in the general population, most women view menopause with relief that they no longer have to worry about pregnancy or menstrual periods. The vast majority have only a few physical symptoms (which can be annoying and bothersome but are temporary), and most do not become depressed; only 3 percent even report regret at having reached menopause (McKinlay, McKinlay, & Brambilla, 1987). In one study of 1,000 postmenopausal women, fewer than half reported physical symptoms and only 5 percent of those complained of mood symptoms (Ness, Aronow, & Beck, 2006). Contrary to stereotype, women in their 40s and 50s often report being most satisfied with the Eriksonian issues of identity, intimacy, and generativity (Newton & Stewart, 2010).

Although women lose their fertility after menopause and men theoretically remain fertile throughout their lives, men have a biological clock too. Testosterone diminishes, although it never drops as sharply in men as estrogen does in women. The sperm count may also gradually drop, and the sperm that remain are more susceptible to genetic mutations that can increase the risk of some diseases in children conceived by older fathers, as we saw earlier (Wyrobek et al., 2006).

The physical changes of midlife do not by themselves predict how people will feel about aging or how they will respond to it (Schaie & Willis, 2002). People's views of aging are profoundly influenced by the culture they live in and by the promises of technology to prolong life and health—some realistic, some still science fiction. Is aging something natural and inevitable, to be accepted

gracefully? Or is it a process to be fought tooth and nail, with every chemical, surgical, and genetic weapon we can lay our hands on? To what extent should society pay for life-extending interventions? These issues will be hotly debated in the years to come.  **Simulate**

menopause The cessation of menstruation and of the production of ova; it is usually a gradual process lasting up to several years.

Old Age

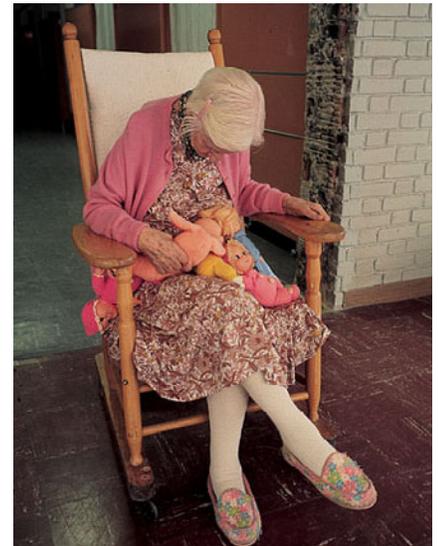
When does old age start? Not long ago, you would have been considered old in your 60s. Today, the fastest-growing segment of the population in North America consists of people over the age of 85. There were 4 million Americans age 85 or older in 2000, and the Census Bureau projects that there may be as many as 31 million by 2050. Close to one million of them will be over the age of 100. How will these people do? *Gerontologists*, researchers who study aging and the old, have been providing some answers.

The first prediction is that the life phase of retirement will change significantly because of demographic changes affecting older people. When people expected to live only until their early 70s, retirement at 65 was associated with loss—a withdrawal from work and fulfilling activities, with not much to look forward to but illness and old age. Today, thanks to the enormous cohort of healthy baby boomers and a changed economy, retirement might last 20 or 30 years. Thus, it is no longer simply a life transition from working to not working. People in the phase of what some psychologists are calling “positive retirement” often find a new career, volunteer work, or new, engrossing activities (Halpern, 2008).

Still, various aspects of intelligence, memory, and other forms of mental functioning do decline

 **Simulate**
Aging and Change in Physical Appearance on mypsychlab.com

The two images of old age: More and more old people are living healthy, active, mentally stimulating lives. But with increasing longevity, many people are also falling victim to degenerative diseases such as Alzheimer's.



fluid intelligence The capacity for deductive reasoning and the ability to use new information to solve problems; it is relatively independent of education and tends to decline in old age.

crystallized intelligence Cognitive skills and specific knowledge of information acquired over a lifetime; it is heavily dependent on education and tends to remain stable over the lifetime.

 **Watch the Video Successfully Aging—Thelma at 83 on mypsychlab.com**

FIGURE 3.5
Changes in Mental Functioning over Time

As these graphs show, some intellectual abilities tend to dwindle with age, but numerical and verbal abilities remain relatively steady over the years.

significantly with age. Older adults score lower on tests of reasoning, spatial ability, and complex problem solving than do younger adults. The ability to produce and spell familiar words declines, a change that often causes great frustration and annoyance (Burke & Shafto, 2004). It takes older people longer to retrieve names, dates, and other information; in fact, the speed of cognitive processing in general slows down. However, older people vary considerably, with some declining significantly and others remaining sharp (Salthouse, 2006).

Fortunately, not all cognitive abilities worsen with age. **Fluid intelligence** is the capacity for deductive reasoning and the ability to use new information to solve problems. It reflects in part an inherited predisposition, and it parallels other biological capacities in its growth and later decline (Bosworth & Schaie, 1999; Li et al., 2004). **Crystallized intelligence** consists of knowledge and skills built up over a lifetime, the kind of intelligence that gives us the ability to do arithmetic, define words, or take political positions. It depends heavily on education and experience, and it tends to remain stable or even improve over the life span (see Figure 3.5). This is why physicians, lawyers, teachers, farmers, musicians, insurance agents, politicians, psychologists, and people in many other occupations can continue working well into old age (Halpern, 2008).  **Watch**

Many of the physical and mental losses that do occur in old age are genetically based and are seen in all societies, but others have to do with cultural, behavioral, and psychological factors (Park & Gutches, 2006). Psychologists have made great strides in separating conditions once thought to be

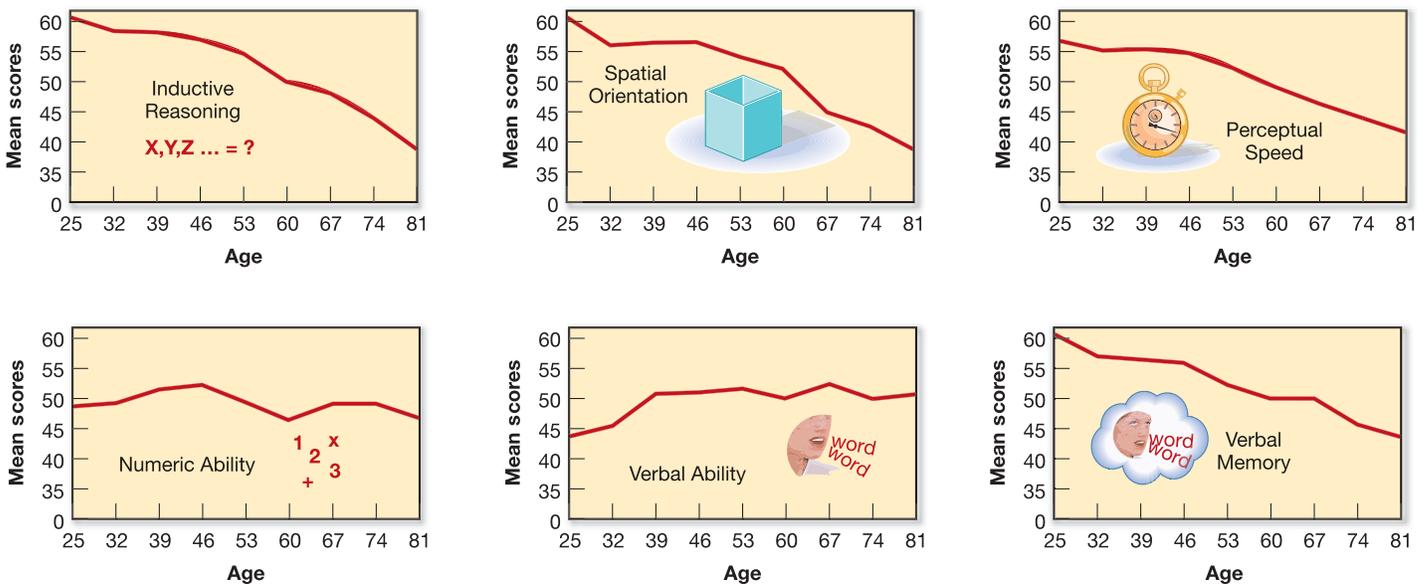
an inevitable part of old age from those that are preventable or treatable:

- Apparent senility in the elderly is often caused by malnutrition, prescription medications, harmful combinations of medications, and even over-the-counter drugs (such as sleeping pills and antihistamines), all of which can be hazardous to old people.
- Weakness, frailty, and even many of the diseases associated with old age are often caused by being inactive and sedentary (Booth & Neuffer, 2005).
- Depression, passivity, and memory problems may result from the loss of meaningful activity, intellectual stimulation, goals to pursue, and control over events (Hess, 2005; Schaie & Zuo, 2001).

Thinking Critically about Mental Declines in Old Age



As these findings would predict, older people can profit from aerobic exercise and strength training, which maintain physical strength and flexibility, boost the brain's blood supply, promote the development of new cells, and can even suppress genetic predispositions for various infirmities. The result is improved cognitive functioning in skills such as planning, concentration, and scheduling (Colcombe & Kramer, 2003; Hertzog et al., 2008). Mental stimulation also fosters the growth of neural connections in the brain, even well into old age. Older adults can sometimes do as well on memory tests as people in their 20s, when given instruction and training. In one project, older people who had shown a decline in inductive reasoning and spatial ability over a 14-year



span were given five hours of training in these skills. This brief intervention produced significant improvements in two-thirds of the sample, and many people performed at or above the level of skill they had had 14 years earlier. More impressive, the effects were still apparent up to seven years later (Kramer & Willis, 2002). Cognitive enrichment cannot prevent most cases of serious cognitive decline and dementia, which are often strongly influenced or even caused directly by genes, but the declines may be delayed (Gatz, 2007; Hertzog et al., 2008).

Perhaps the best news is that as people get older, most become better able to regulate negative feelings and emphasize the positive. The frequency of intense negative emotions is highest among people aged 18 to 34, then drops sharply to age 65. After 65, it levels off, rising only slightly among old people facing crises of illness and bereavement

(Charles & Carstensen, 2004; Charles, Reynolds, & Gatz, 2001). Apparently, many people do grow wiser, or at least more tranquil, with age.

Some researchers who study aging are therefore optimistic. In their view, people who have challenging occupations and interests, who remain active mentally, who exercise regularly, and who adapt flexibly to change and loss are likely to maintain their cognitive abilities and well-being. “Use it or lose it,” they say. Other researchers, however, are less upbeat. “When you’ve lost it, you can’t use it,” they reply. They are worried about the growing numbers of people living into their 90s and beyond, when rates of cognitive impairment and dementia rise dramatically. The challenge for society is to prepare for the many people who will be living into advanced old age, by helping as many as possible to keep using their brains instead of losing them.

Quick Quiz

People of any age can answer this quiz.

1. The key psychological issue during adolescence, said Erikson, is a(n) _____ crisis.
2. What new phase of life development has emerged because of demographic changes, and what years does it include?
3. Most women react to menopause by (a) feeling depressed, (b) regretting the loss of femininity, (c) going a little crazy, (d) feeling relieved or neutral.
4. Which of these statements about the decline of mental abilities in old age is *false*? (a) It can often be lessened with training programs; (b) it inevitably declines sharply; (c) it is sometimes a result of malnutrition, medication, or disease rather than aging; (d) it is slowed when people live in stimulating environments.
5. Suddenly, your 80-year-old grandmother has become confused and delusional. Before concluding that old age has made her senile, what other explanation should you rule out?

Answers:

1. Identity 2. emerging adulthood, ages 18 to 25 3. d 4. b 5. You should be sure she is not malnourished and you should rule out the possibility that she is taking too many medications, including nonprescription drugs.

✓ Study and Review on myspsychlab.com



YOU are about to learn...

- why terrible childhood experiences do not inevitably affect a person forever.
- what makes most children resilient in the face of adversity.

The Wellsprings of Resilience

Most people take it for granted that the path from childhood to adolescence to adulthood is a fairly straight one. We think of the lasting attitudes, habits,

and values our parents taught us. We continue to have deep attachments to our families, even when we are fighting with them. And many people carry with them the scars of emotional wounds they suffered as children. Children who have been beaten, neglected, or constantly subjected to verbal or physical abuse by their parents are more likely than other children to have emotional problems, become delinquent and violent, commit crimes, have low IQs, drop out of school, develop mental disorders such as depression, and develop chronic stress-related illnesses (Emery & Laumann-Billings, 1998; Margolin & Gordis, 2004; Repetti, Taylor, & Seeman, 2002).

And yet, when researchers began to question the entrenched assumption that early trauma

always has long-lasting negative effects and considered the evidence for alternative views, they got quite a different picture. Most children, they found, are resilient, eventually overcoming even the effects of war, childhood illness, having abusive or alcoholic parents, early deprivation, or being sexually molested (Kaufman & Zigler, 1987; Nelson et al., 2007; Rathbun, DiVirgilio, & Waldfoegel, 1958;



**Thinking Critically
about the Effects of
Childhood Traumas**

Rind, Tromovitch, & Bauserman, 1998; Rutter et al., 2004; Werner, 1989; West & Prinz, 1987).

Psychologist Ann Masten (2001) observed that most people assume there is something special and rare about people who recover from adversity. But the great surprise of the research, she concluded, is how ordinary resilience is. Many of the children who outgrow early deprivation and trauma have easygoing temperaments or personality traits, such as self-efficacy and self-control, that help them roll with even severe punches. They have a secure attachment

style, which helps them work through traumatic events in a way that heals their wounds and restores hope and emotional balance (Mikulincer, Shaver, & Horesh, 2006). If children lack secure attachments with their own parents, they may be rescued by love and attention from their siblings, peers, extended family members, or other caring adults. And some have experiences outside the family—in schools, places of worship, or other organizations—that give them a sense of competence, moral support, solace, religious faith, and self-esteem (Cowen et al., 1990; Garmezy, 1991).

Perhaps the most powerful reason for the resilience of so many children, and for the changes that all of us make throughout our lives, is that we are all constantly interpreting our experiences. We can decide to repeat the mistakes our parents made or break free of them. We can decide to remain prisoners of childhood or to strike out in new directions at age 20, 50, or 70. We can decide for ourselves whether we want to remain prisoners of childhood or to be liberated by the possibilities of adulthood.

Psychology in the News

REVISITED

Has our review of events across the life span helped you to clarify your thoughts about women and men who become parents in their 60s or 70s? As we have seen, the whole concept of natural, limited stages in the life cycle is changing. Having a child in one's 40s used to seem as weird and unnatural as having a baby in one's 60s, but now it is common. Will giving birth after 50 come to be seen the same way? After all, adolescence has stretched into “emerging adulthood.” Retirement has extended into “positive retirement.” Parenthood occurs ... virtually at any age? If we can live to 100, why not have a baby at 70?

Adriana Iliescu, who had her daughter at age 66, held a party on the child's first birthday, telling the press, “I can't describe how I feel when I hug her, when I kiss her. It's a special kind of feeling. And [raising her] is not as tough as I had expected.” At this writing, Iliescu is alive and caring for her daughter. But when her child is 16, how will it be for her to have a mother who is 82? What if her mother becomes ill? Iliescu is unmarried and says she does not have much of an extended family or many friends. She admits she has

no plans for the child if she should become ill and unable to care for her. In contrast, Arceli Keh, who was merely 63

when she had her baby, has a husband and extended family involved in the child's care.

What about the Indian couple in their 70s, whose story opened this chapter? Will they survive to see their twins even through childhood? Carmela Bousada's case is instructive. After being inseminated with an embryo from a donor egg and sperm, Bousada delivered twin boys a week before her 67th birthday. Because her mother died at the age of 101, and because she herself felt physically fit, she assumed she would live as long. But Bousada, who was single, died of cancer at age 69, when her twins were only 2 years old.

Some fertility experts and ethicists are extremely concerned about the medical, social, and psychological costs of pregnancy and raising a child so late in life. They worry that stories about old women giving birth raise women's expectations to unreasonable heights





Adriana Iliescu with Eliza Maria on the baby's first birthday.

and create false hopes that technology can easily overcome any biological limitations. For every successful pregnancy among older women, there are thousands

of failures; and the older a woman is, the greater her chance of developing medical problems in pregnancy (such as gestational diabetes and high blood pressure). Moreover, we have seen that age brings a decline in some cognitive and physical abilities and an increasing chance of dementia.

So it seems legitimate to worry about whether elderly parents—of either sex—will have the mental resources and energy to guide their children through the many hurdles of childhood and adolescence. On the other hand, although it is true that women who choose to have children in their 60s and 70s are rare, millions of older people, required by unforeseen circumstances to rear their grandchildren, have risen to the challenge.

In the next decades, as the world changes in countless unpredictable ways, the territory of adulthood will continue to expand, providing new frontiers as well as fewer signposts and roadmaps to guide us. Increasingly, age will be what we make of it.

Taking Psychology with You

Bringing Up Baby

Every year or so another best-selling book arrives to tell parents they've been doing it all wrong. Countless books have advised parents to treat their children in very specific, if contradictory, ways: Pick them up, don't pick them up; respond when they cry, don't respond when they cry; let them sleep with you, never let them sleep with you; be affectionate, be stern; be highly sensitive to their every need so they will securely attach to you, don't overreact to their every mood or complaint or you will spoil them. A billion-dollar industry has emerged to calm (and inflame) parental worries, offering expensive strollers, toys, and "fetal education" and baby sign language programs—all to create the perfect child (Paul, 2008).

No need to panic. Critical thinkers can call upon two lines of evidence, described in this chapter, to protect themselves from the guilt-mongers and marketers. One is that babies and young children thrive under a wide variety of child-rearing methods. The second is that babies bring their own temperaments and other

genetic predispositions to the matter of how best to raise them. Most respond readily to induction, but others require stricter discipline.

Well, then, how should you treat your children? Should you be strict or lenient, powerful or permissive? Should you require them to stop having tantrums, to clean up their rooms, to be polite? Should you say, "Oh, nothing I do will matter, anyway," or "If I don't get 100 percent compliance on every order, this kid is going to boot camp"? Child development research does suggest general principles that can help parents find that middle way and foster their children's confidence and helpfulness:

Set high expectations that are appropriate to the child's age and temperament, and teach the child how to meet them. Some parents make few demands on their children, either unintentionally or because they believe a parent should not impose standards. Others make many demands, such as requiring children to be polite, help with chores, control their anger, be thoughtful of others, and do well in school. The children of parents who

make few demands tend to be aggressive, impulsive, and immature. The children of parents who have high but realistic expectations tend to be helpful and above average in competence and self-confidence (Damon, 1995).

Explain, explain, explain. Induction, telling a child why you have applied a rule, teaches a child to be responsible. Punitive methods ("Do it or I'll spank you") may result in compliance, but the child will tend to disobey as soon as you are out of sight. Explanations also teach children how to reason and understand. While setting standards for your children, you can also allow them to express disagreements and feelings. This does not mean you have to argue with a 4-year-old about the merits of table manners or permit antisocial and destructive behavior. Once you have explained a rule, you need to enforce it consistently.

Encourage empathy. Call the child's attention to the effects of his or her actions on others and appeal to the child's sense of fair play and desire to be good. As we saw, even very young children are capable of empathy. Vague

orders, such as “Don’t fight,” are less effective than showing the child how fighting disrupts and hurts others.

Notice, approve of, and reward good behavior. Many parents punish the behavior they dislike, a form of attention that may be rewarding to the child. It is much more effective to praise the behavior you do want, which teaches the child what is expected.

Remember the critical-thinking guideline “don’t oversimplify.” The challenge is to avoid the twin fallacies of “It’s all genetic” and “If I just do all the right things, whatever they are, my child will be intelligent, kind, and successful.” Even with the best skills and intentions, you cannot control everything that happens to your child or remodel your child’s temperamental dispositions. Besides, as children grow up, they are influenced by their

peers and generation and by particular experiences that shape their interests and motivation. But you do have the power to make your children’s lives miserable or secure. You also have the power to profoundly affect the *quality* of the relationship you will have with your child throughout life: one filled with conflict and resentment, or one that is close and loving.

Summary Listen to an audio file of your chapter on myspsychlab.com

- *Developmental psychologists* study how people grow and change over the life span. Many study *socialization*, the process by which children learn the rules and behavior society expects of them.

From Conception through the First Year

- *Maturation* is the unfolding of genetically influenced behavior and characteristics. Prenatal development consists of the *germinal*, *embryonic*, and *fetal* stages. Harmful influences that can adversely affect the fetus’s development include German measles, toxic substances, some sexually transmitted diseases, cigarettes, alcohol (which can cause *fetal alcohol syndrome* and cognitive deficits), illegal drugs, and even over-the-counter medications. Fathers affect prenatal development too; the sperm of teenage boys and men over 50 may have mutations that increase the risk of miscarriage, birth defects, and certain diseases in their offspring.
- Babies are born with *motor reflexes* and a number of perceptual abilities. Cultural practices affect the timing of physical milestones.
- Babies’ innate need for *contact comfort* gives rise to emotional attachment to their caregivers, and by the age of 6 to 8 months, infants begin to feel *separation anxiety*. Studies of the *Strange Situation* have distinguished *secure* from *insecure* attachment; insecurity can take one of two forms, *avoidant* or *anxious-ambivalent* attachment.
- Styles of attachment are relatively unaffected by the normal range of child-rearing practices, and also by whether or not babies spend time in daycare. Insecure attachment is promoted by parents’ rejection, mistreatment, or abandonment of their infants; by a mother’s postpartum depression, which can affect her ability to care for the baby; by the child’s own fearful, insecure temperament; or by stressful family situations.

Language Development

- Human beings are the only species that uses *language* to express and comprehend an infinite number of novel utterances, think about the past and future, and describe things or people who are not present. An innate capacity for language may have evolved in humans because it enhanced the chances of survival and the establishment of social bonds.
- Language acquisition may begin in the womb, as even newborns can distinguish the language their mother spoke during pregnancy from an unfamiliar language. Infants are responsive to the pitch, intensity, and sound of language, which may be why adults in many cultures speak to babies in *parentese*, using higher-pitched words and exaggerated intonation of vowels. At 4 to 6 months of age, babies can often recognize their own names and other words that are regularly spoken with emotion. Babies go through a babbling phase from age 6 months to 1 year, and at about 1 year, they start saying single words and using symbolic gestures, which continue to be important for language, thinking, and problem solving. At age 2, children speak in two- or three-word *telegraphic* sentences that convey a variety of messages.
- Noam Chomsky argued that the ability to take the *surface structure* of any utterance and apply rules of *syntax* to infer its underlying *deep structure* must depend on an innate faculty for language, a mental module that is sensitive to a *universal grammar* (features common to all languages). Many findings support this view: Children from different cultures go through similar stages of language development; children’s language is full of *overregularizations* reflecting grammatical rules; adults do not consistently correct their children’s syntax; groups of children who have never been exposed to adult language often invent their own; and young infants can derive linguistic rules from strings of sounds.

- Some scientists, on the other hand, have devised computer models of language acquisition that do not assume an innate capacity. Some argue that instead of inferring grammatical rules, children learn the statistical probability that any given word or syllable will follow another. Parental practices also aid a child's language acquisition. Biological readiness and experience interact in the development of language.

Cognitive Development

- Jean Piaget argued that cognitive development depends on an interaction between maturation and a child's experiences in the world. Children's thinking changes and adapts through *assimilation* and *accommodation*. Piaget proposed four stages of cognitive development: (1) *sensorimotor* (birth to age 2), during which the child learns *object permanence*; (2) *preoperational* (ages 2 to 7), during which language and symbolic thought develop, although the child remains *egocentric* in reasoning and has difficulty with some mental *operations*; (3) *concrete operations* (ages 7 to 12), during which the child comes to understand *conservation*, identity, and serial ordering; and (4) *formal operations* (age 12 to adulthood), during which abstract reasoning develops.

- Modern researchers have found that the changes from one stage to another are not as clear-cut as Piaget implied; development is more continuous and overlapping. More important, babies and young children have greater cognitive abilities than Piaget thought, perhaps because of the core knowledge they are born with. Young children are not always egocentric in their thinking. By the age of 4 or 5, they have developed a *theory of mind* to account for their own and other people's behavior. Cultural practices affect the pace and content of cognitive development.

Moral Development

- Lawrence Kohlberg proposed that as children mature cognitively, they go through three levels of moral reasoning. But people can reason morally without behaving morally. Developmental psychologists study how children learn to internalize standards of right and wrong and to behave accordingly. This ability depends on the emergence of conscience and the moral emotions of guilt, shame, and empathy, and on the ability of children to learn to regulate their impulses, wishes, and feelings.

- As a strategy for teaching children to behave, a parent's use of *power assertion* is associated with a child's aggressiveness and lack of empathy. *Induction* is associated with children who develop empathy, internalize moral standards, and can resist temptation. But all methods of discipline interact with the child's own temperament.

- The capacity of very young children for *self-regulation* is associated with the development of internalized moral standards and conscience. This ability is enhanced by mothers who use induction as a primary form of discipline. It also may reflect a personality trait, because it tends to emerge very early in life and to be consistent over time and across situations.

Gender Development

- Gender development includes the emerging awareness of *gender identity*, the understanding that people are biologically male or female regardless of what they do or wear, and *gender typing*, the process by which boys and girls learn what it means to be masculine or feminine in their culture. Some individuals are born with *intersex* physical conditions, living with the physical attributes of both sexes, and consider themselves to be *transgender*. *Transsexuals* feel that they are male in a female body or vice versa; their gender identity is at odds with their anatomical sex.

- Universally, young children tend to prefer same-sex toys and playing with other children of their own sex. Biological psychologists account for this phenomenon in terms of genes and prenatal androgens, which appear to be involved in gender-typed play. Cognitive psychologists study how children develop *gender schemas* for the categories "male" and "female," which in turn shape their gender-typed behavior. Gender schemas tend to be inflexible at first. Later they become more flexible as the child cognitively matures and assimilates new information, if the child's culture promotes flexible gender schemas. Learning theorists study the direct and subtle reinforcers and social messages that foster gender typing.

- Gender development changes over the life span, depending on people's experiences with work and family life and larger events in society and their culture.

Adolescence

- *Adolescence* begins with the physical changes of *puberty*. In girls, puberty is signaled by *menarche* and the development of breasts; in boys, it begins with the onset of nocturnal emissions and the development of the testes, scrotum, and penis. Hormones produce *secondary sex* characteristics, such as pubic hair in both sexes and a deeper voice in males.

- The adolescent brain undergoes a major pruning of neural connections, primarily in the prefrontal cortex and the limbic system, and *myelination*, which improves the efficiency of neural transmission and strengthens the connections between these two brain areas. These neurological changes may not be complete until the early 20s, which would help explain why the strong emotions of the adolescent years sometimes

overwhelm rational decision making and why teenagers often behave more impulsively than adults. This evidence may have implications for how teenagers who break the law should be treated.

- Most American adolescents do not go through extreme emotional turmoil, anger, or rebellion, and do not dislike their parents. They do not suffer from unusually low self-esteem or its opposite, extreme narcissism. However, conflict with parents, mood swings and depression, and reckless or rule-breaking behavior do increase in adolescence. The peer group becomes especially important, and peer bullying, online or offline, is often the source of teenagers' greatest unhappiness. Boys tend to externalize their emotional problems in acts of aggression and other antisocial behavior; girls tend to internalize their problems by becoming depressed or developing eating disorders.

Adulthood

- Erik Erikson proposed that life consists of eight stages, each with a unique psychological challenge, or crisis, that must be resolved, such as an *identity crisis* in adolescence. Erikson identified many of the essential concerns of adulthood and showed that development is a lifelong process. However, psychological issues or crises are not confined to particular chronological periods or stages.

- When most people in an age group go through the same event at about the same time, transitions are easier than when people feel out of step. In industrialized nations, major demographic changes have caused young adults to postpone the timing of career decisions, marriage or commitment to a partner, and parenthood. Many people between the ages of 18 and 25, especially if they are not financially independent, find themselves in a life phase often called *emerging adulthood*.

- The middle years are generally not a time of turmoil or crisis but the prime of most people's lives. In women, *menopause* begins in the late 40s or early 50s. Many

women have temporary physical symptoms, but most do not regret the end of fertility or become depressed and irritable. In middle-aged men, hormone production slows down and sperm counts decline; fertility continues, but with increased risk of fetal abnormalities.

- *Gerontologists* have revised our ideas about old age, now that people are living longer and healthier lives and entering an extended phase of positive retirement. The speed of cognitive processing slows down, and *fluid intelligence* parallels other biological capacities in its eventual decline. *Crystallized intelligence*, in contrast, depends heavily on culture, education, and experience, and it tends to remain stable over the life span.

- Many supposedly inevitable results of aging, such as senility, depression, and physical frailty, are often avoidable. They may result from disease, medication, or poor nutrition, and also from lack of stimulation, control of one's environment, and physical strength and fitness. Exercise and mental stimulation promote the growth of synapses in the human brain, even well into old age, although some mental losses are inevitable.

The Wellsprings of Resilience

- Children who experience violence or neglect are at risk of many problems later in life, but most children are resilient and are able to overcome early adversity. Psychologists now study not only the sad consequences of neglect, poverty, and violence but also the reasons for resilience under adversity.

Taking Psychology with You

- Many child-rearing experts claim to have the one right way to make children smarter, nicer, and more successful. Research in child development can help people think critically about such claims and also offers some general guidelines: Set high but realistic expectations, explain the reasons for your rules, encourage empathy, and reward good behavior.

Key Terms

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socialization 73

maturation 74

germinal, embryonic, fetal stages 74

zygote 74

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Developmental psychologists study people's growth and change over the life span. They begin with **socialization**, the process by which children learn the attitudes and behaviors expected of them by their society.

From Conception through the First Year

Stages of Prenatal Development

- Germinal
- Embryonic
- Fetal

Prenatal Influences

- Some diseases, including German measles and sexually transmitted diseases
- Cigarettes, drugs, alcohol (which can cause *fetal alcohol syndrome*)
- Exposure to X-rays or toxic chemicals

The Infant's World

- Babies are born with motor reflexes, including rooting, sucking, and grasping.
- Newborns also have some innate perceptual abilities.
- Cultural influences affect maturational milestones, such as an infant's sleeping through the night.

Attachment

Attachment begins with **contact comfort**, the reassuring pleasure of being touched and held by the parent or other caregiver.



Between 6 and 8 months of age, babies develop **separation anxiety** if their primary caregiver temporarily leaves them.

Styles of attachment are unaffected by normal child-rearing practices and whether a child goes to daycare. Insecure attachment is promoted by extreme deprivation in infancy; abusive or erratic parenting; stressful family changes; and the child's own fearful temperament.

Babies may be securely or insecurely attached. Insecure babies may, in turn, be avoidant or anxious-ambivalent.

Cognitive Development

Language is a set of rules for combining elements that are inherently meaningless into utterances that convey meaning.

Language Development

- Acquiring language begins in the womb, as newborns recognize the language their mothers spoke during pregnancy.
- First few months: Babies coo and respond to rhythms and emotions in voices.
- 4 to 6 months: Babies begin to recognize key consonant and vowel sounds of their native language.
- 6 months to 1 year: Infants become able to distinguish words from the flow of speech.
- End of first year: Infants start to name things based on familiar concepts and use symbolic gestures to communicate.
- 18 to 24 months: Children begin to speak in two- and three-word phrases (**telegraphic speech**) and understand verbs from the context in which they occur.
- 2 to 6 years: Children rapidly acquire new words, inferring their meaning from the grammatical and social contexts in which they hear them.



Noam Chomsky argued that the human brain contains an innate mental module containing a **universal grammar**, which enables young children to acquire language readily. Children learn to take the surface structure of a sentence and apply grammatical rules (**syntax**) to infer an underlying deep structure, which contains the sentence's meaning.

Findings supporting Chomsky's view:

1. Children in different cultures go through similar stages of linguistic development.
2. Children combine words in ways that adults never would.
3. Adults do not consistently correct their children's syntax, yet children learn language correctly.
4. Children who are not exposed to adult language may invent a language of their own.
5. Infants as young as 7 months can derive simple linguistic rules from a string of sounds.

Findings contradicting Chomsky's view:

1. Computer programs, despite being incapable of inheriting an innate mental module, can acquire many linguistic features of language.
2. Adults do frequently correct the speech of children and model correct language usage.
3. Children not exposed to language at an early age rarely acquire completely normal speech.

Cognitive Development

Jean Piaget argued that cognitive development depends on an interaction between maturation and a child's experience, and adapts through *assimilation* and *accommodation*.

Piaget's four stages of cognitive development:

1. Sensorimotor (birth to age 2): child learns **object permanence**
2. Preoperational (ages 2 to 7): development of language and symbolic thought
3. Concrete operations (ages 7 to 12): understanding of **conservation**, identity, and serial ordering
4. Formal operations (age 12 to adulthood): development of abstract reasoning

Findings challenge many of Piaget's views:

1. Cognitive abilities develop in continuous, overlapping waves, rather than in discrete stages.
2. Preschoolers are not as **egocentric** as Piaget thought. As young as 3 to 4 years, children begin developing a **theory of mind**, a system of beliefs about how their own and other people's minds work.
3. Children, even infants, reveal cognitive abilities much earlier than Piaget believed possible.
4. Cognitive development is influenced by a child's culture.

Learning to be Good

Moral Development

- Parental methods of discipline often have different consequences for children's moral behavior.
- **Power assertion** is associated with children who are aggressive and fail to internalize moral standards.
 - **Induction** is associated with children who develop empathy and internalized moral standards and who can resist temptation.
 - Young children's ability to regulate their impulses is associated with later internalized moral standards and conscience.

Gender Development

- Gender identity:** The cognitive understanding that a person is biologically male or female.
- Gender typing:** The process by which boys and girls learn what it means to be masculine or feminine.
- Intersex conditions:** Conditions in which children are born with ambiguous genitals, or genitals that conflict with their chromosomes; as adults, they may consider themselves **transgender**.

- **Biological psychologists** account for gender differences in behavior in terms of genes and prenatal hormones.
- **Cognitive psychologists** study how children develop **gender schemas** of "male" and "female" qualities, which shape their gender-typed behavior.
- **Learning theorists** study the direct and subtle reinforcers and social messages that foster gender typing.
- People's gender schemas, attitudes, and behavior evolve throughout their lives, with new experiences and societal changes.

Adolescence

Biological Changes

- Adolescence begins with the physical changes of **puberty**, including **menarche** in females and genital maturation in males.
- The brain goes through significant development as new connections among brain cells are added and others are pruned away.

Psychological Issues

- The stereotype of "adolescent turmoil"—rebellion and misery—is inaccurate for most teens. However, conflicts with parents, mood swings, and rule-breaking behavior do increase.
- The peer group becomes especially important.

The Transitions of Life

Adulthood

Erik Erikson's Stages

- Trust versus mistrust
- Autonomy (independence) versus shame and doubt
- Initiative versus guilt
- Competence versus inferiority
- Identity versus role confusion
- Intimacy versus isolation
- Generativity versus stagnation
- Ego integrity versus despair

- "Emerging adulthood" describes a life phase that occurs between 18 and 25, in which young adults accept some responsibilities of adulthood and delay others.
- The middle years are the prime of most people's lives. **Menopause** begins in women during their late 40s or early 50s, causing some physical symptoms but rarely the emotional distress portrayed in the media. In men, testosterone and sperm production decline.
- People's views of aging are influenced by the culture they live in and by the promises of technology—realistic and unrealistic—to prolong life and health.

Old Age

- Research in the field of **gerontology** shows that **fluid intelligence** parallels other biological capacities in its eventual decline, whereas **crystallized intelligence** tends to remain stable or even improve over the life span.
- Senility, depression, and physical frailty in old age are often the result of disease, medication, poor nutrition, and lack of stimulation and control of one's environment. Exercise and mental stimulation promote the growth of synapses in the human brain, even well into old age.