

## section six

*In no order of things is adolescence the simple time of life.*

—**JEAN ERSKINE STEWART**  
*American Writer, 20th Century*

# Adolescence

Adolescents try on one face after another, seeking to find a face of their own. Their generation of young people is the fragile cable by which the best and the worst of their parents' generation is transmitted to the present. In the end, there are only two lasting bequests parents can leave youth—one being roots, the other wings. Section 6 contains two chapters: "Physical and Cognitive Development in Adolescence" (Chapter 11) and "Socioemotional Development in Adolescence" (Chapter 12).







# chapter 11

# PHYSICAL AND COGNITIVE DEVELOPMENT IN ADOLESCENCE

## chapter outline

### 1 The Nature of Adolescence

**Learning Goal 1** Discuss the nature of adolescence.

### 2 Physical Changes

**Learning Goal 2** Describe the changes involved in puberty as well as the changes in the brain and sexuality during adolescence.

Puberty  
The Brain  
Adolescent Sexuality

### 3 Issues in Adolescent Health

**Learning Goal 3** Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Adolescent Health  
Substance Use and Abuse  
Eating Disorders

### 4 Adolescent Cognition

**Learning Goal 4** Explain cognitive changes in adolescence.

Piaget's Theory  
Adolescent Egocentrism  
Information Processing

### 5 Schools

**Learning Goal 5** Summarize some key aspects of how schools influence adolescent development.

The Transition to Middle or Junior High School  
Effective Schools for Young Adolescents  
High School  
Extracurricular Activities  
Service Learning



**F**ifteen-year-old Latisha developed a drinking problem, and she was kicked off the cheerleading squad for missing practice so often—but that didn't stop her drinking.

She and her friends began skipping school regularly so they could drink. Fourteen-year-old Arnie is a juvenile delinquent. Last week he stole a TV set, struck his mother and bloodied her face, broke some streetlights in the neighborhood, and threatened a boy with a wrench and hammer.

Twelve-year-old Katie, more than just about anything else, wanted a playground in her town. She knew that the other kids also wanted one, so she put together a group that generated funding ideas for the playground. They presented their ideas to the town council. Her group involved more youth, and they raised money by selling candy and sandwiches door-to-door. The playground became a reality, a place where, as Katie says, "People have picnics and make friends." Katie's advice: "You won't get anywhere if you don't try."

Adolescents like Latisha and Arnie are the ones we hear about the most. But there are many adolescents like Katie who contribute in positive ways to their community and competently make the transition through adolescence. Indeed, for most adolescents, adolescence is not a time of rebellion, crisis, pathology, and deviance. A far more accurate vision of adolescence is that it is a time of evaluation, decision making, commitment, and carving out a place in the world. Most of the problems of today's youth are not with the youth themselves. What adolescents need is access to a range of legitimate opportunities and to long-term support from adults who care deeply about them (Balsano, Theokas, & Bobek, 2009; Lerner & others, 2009; Swanson, Edwards, & Spencer, 2010).

## topical connections

In middle and late childhood, physical growth continues but at a slower pace than in infancy and early childhood. Gross motor skills become much smoother and more coordinated, and fine motor skills also improve. Significant advances in the development of the prefrontal cortex occur. Cognitive and language skills also improve considerably. In terms of cognitive development, most children become concrete operational thinkers, long-term memory increases, and metacognitive skills improve, especially if children learn a rich repertoire of strategies. In terms of language development, children's understanding of grammar and syntax increases, and learning to read becomes an important achievement.

## ← looking back

# preview

Adolescence is a transitional period in the human life span, linking childhood and adulthood. We begin the chapter by examining some general characteristics of adolescence followed by coverage of major physical changes and health issues of adolescence. Then we consider the significant cognitive changes that characterize adolescence and various aspects of schools for adolescents.

## 1 The Nature of Adolescence

LG1

Discuss the nature of adolescence.



Growing up has never been easy. However, adolescence is not best viewed as a time of rebellion, crisis, pathology, and deviance. A far more accurate vision of adolescence describes it as a time of evaluation, of decision making, of commitment, and of carving out a place in the world. Most of the problems of today's youth are not with the youth themselves. What adolescents need is access to a range of legitimate opportunities and to long-term support from adults who deeply care about them. *What might be some examples of such support and caring?*

As in development during childhood, genetic/biological and environmental/social factors influence adolescent development. During their childhood years of development, adolescents experienced thousands of hours of interactions with parents, peers, and teachers, but now they face dramatic biological changes, new experiences, and new developmental tasks. Relationships with parents take a different form, moments with peers become more intimate, and dating occurs for the first time, as do sexual exploration and possibly intercourse. The adolescent's thoughts are more abstract and idealistic. Biological changes trigger a heightened interest in body image. Adolescence has both continuity and discontinuity with childhood.

There is a long history of worrying about how adolescents will “turn out.” In 1904, G. Stanley Hall proposed the “storm-and-stress” view that adolescence is a turbulent time charged with conflict and mood swings.

However, when Daniel Offer and his colleagues (1988) studied the self-images of adolescents in the United States, Australia, Bangladesh, Hungary, Israel, Italy, Japan, Taiwan, Turkey, and West Germany, at least 73 percent of the adolescents displayed a healthy self-image. Although there were differences among them, the adolescents were happy most of the time, they enjoyed life, they perceived themselves as able to exercise self-control, they valued work and school, they felt confident about their sexual selves, they expressed positive feelings toward their families, and they felt they had the capability to cope with life's stresses: not exactly a storm-and-stress portrayal of adolescence.

Public attitudes about adolescence emerge from a combination of personal experience and media portrayals, neither of which produces an objective picture of how normal adolescents develop (Feldman & Elliott, 1990). Some of the readiness to assume the worst about adolescents likely involves the short memories of adults. Many adults measure their current perceptions of adolescents by their memories of their own adolescence. Adults may portray today's adolescents as



more troubled, less respectful, more self-centered, more assertive, and more adventurous than they were.

However, in matters of taste and manners, the young people of every generation have seemed unnervingly radical and different from adults—different in how they look, in how they behave, in the music they enjoy, in their hairstyles, and in the clothing they choose. It is an enormous error, though, to confuse adolescents' enthusiasm for trying on new identities and enjoying moderate amounts of outrageous behavior with hostility toward parental and societal standards. Acting out and boundary testing are time-honored ways in which adolescents move toward accepting, rather than rejecting, parental values.

Most adolescents negotiate the lengthy path to adult maturity successfully, but too large a group does not (Lerner, Roeser, & Phelps, 2009). Ethnic, cultural, gender, socioeconomic, age, and lifestyle differences influence the actual life trajectory of every adolescent (Schlegel, 2009; Swanson, Edwards, & Spencer, 2010). Different portrayals of adolescence emerge, depending on the particular group of adolescents being described (Fuligni, Hughes, & Way, 2009). Today's adolescents are exposed to a complex menu of lifestyle options through the media, and many face the temptations of drug use and sexual activity at increasingly young ages. Too many adolescents are not provided with adequate opportunities and support to become competent adults (McLoyd & others, 2009).

## Review Connect Reflect

**LG1** Discuss the nature of adolescence.

### Review

- What characterizes adolescent development?

### Connect

- The last line of the previous section mentioned opportunities and support during adolescence. In the previous chapters, what did you learn about the role parents play in their children's lives

*leading up to adolescence that can affect the adolescent years?*

### Reflect Your Own Personal Journey of Life

- Was your adolescence better described as a stormy and stressful time or as one of trying out new identities as you sought to find an identity of your own? Explain.

## 2 Physical Changes

**LG2** Describe the changes involved in puberty, as well as the changes in the brain and sexuality during adolescence.

Puberty

The Brain

Adolescent Sexuality

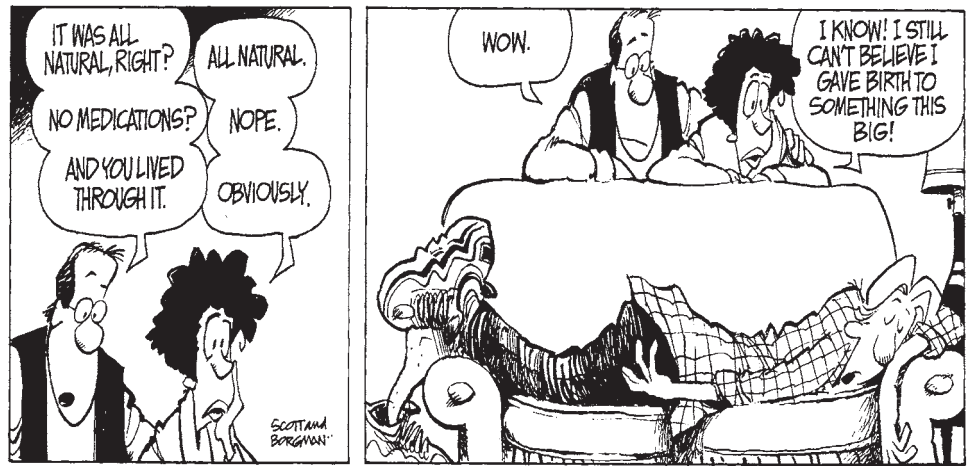
One father remarked that the problem with his teenage son was not that he grew, but that he did not know when to stop growing. As we will see, there is considerable variation in the timing of the adolescent growth spurt. In addition to pubertal changes, other physical changes we will explore involve sexuality and the brain.

## PUBERTY

Puberty is not the same as adolescence. For most of us, puberty ends long before adolescence does, although puberty is the most important marker of the beginning of adolescence. **Puberty** is a period of rapid physical maturation involving hormonal and bodily changes that occurs primarily during early adolescence. Puberty is not a single, sudden event. We know whether a young boy or girl is going

**puberty** A period of rapid physical maturation, occurring primarily in early adolescence, that involves hormonal and bodily changes.





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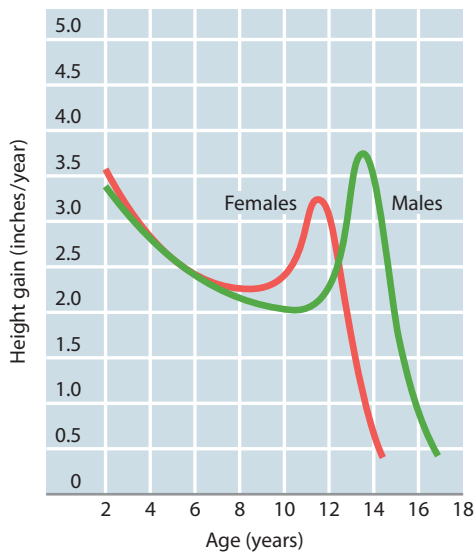
through puberty, but pinpointing puberty's beginning and end is difficult. Among the most noticeable changes are signs of sexual maturation and increases in height and weight.

**Sexual Maturation, Height, and Weight** Think back to the onset of your puberty. Of the striking changes that were taking place in your body, what was the first to occur? Researchers have found that male pubertal characteristics typically develop in this order: increase in penis and testicle size, appearance of straight pubic hair, minor voice change, first ejaculation (which usually occurs through masturbation or a wet dream), appearance of kinky pubic hair, onset of maximum growth in height and weight, growth of hair in armpits, more detectable voice changes, and, finally, growth of facial hair.

What is the order of appearance of physical changes in females? First, either the breasts enlarge or pubic hair appears. Later, hair appears in the armpits. As these changes occur, the female grows in height and her hips become wider than her shoulders. **Menarche**—a girl's first menstruation—comes rather late in the pubertal cycle. Initially, her menstrual cycles may be highly irregular. For the first several years, she may not ovulate every menstrual cycle; some girls do not ovulate at all until a year or two after menstruation begins. No voice changes comparable to those in pubertal males occur in pubertal females. By the end of puberty, the female's breasts have become more fully rounded.

Marked weight gains coincide with the onset of puberty. During early adolescence, girls tend to outweigh boys, but by about age 14 boys begin to surpass girls. Similarly, at the beginning of the adolescent period, girls tend to be as tall as or taller than boys of their age, but by the end of the middle school years most boys have caught up or, in many cases, surpassed girls in height.

As indicated in Figure 11.1, the growth spurt occurs approximately two years earlier for girls than for boys. The mean age at the beginning of the growth spurt in girls is 9; for boys, it is 11. The peak rate of pubertal change occurs at 11½ years for girls and 13½ years for boys. During their growth spurt, girls increase in height about 3½ inches per year, boys about 4 inches. Boys and girls who are shorter or taller than their peers before adolescence are likely to remain so during adolescence; however, as much as 30 percent of an individual's height in late adolescence is unexplained by his or her height in the elementary school years.



**FIGURE 11.1**

**PUBERTAL GROWTH SPURT.** On average, the peak of the growth spurt during puberty occurs two years earlier for girls (11½) than for boys (13½). How are hormones related to the growth spurt and to the difference between the average height of adolescent boys and that of girls?

**menarche** A girl's first menstruation.

**hormones** Powerful chemical substances secreted by the endocrine glands and carried through the body by the bloodstream.

**Hormonal Changes** Behind the first whisker in boys and the widening of hips in girls is a flood of **hormones**, powerful chemical substances secreted by the

endocrine glands and carried through the body by the bloodstream (Susman & Dorn, 2009; Wankowska & Polkowska, 2010).

The concentrations of certain hormones increase dramatically during adolescence (Roa & others, 2010). *Testosterone* is a hormone associated in boys with the development of genitals, an increase in height, and a change in voice. *Estradiol* is a type of estrogen; in girls it is associated with breast, uterine, and skeletal development. In one study, testosterone levels increased eighteen-fold in boys but only twofold in girls during puberty; estradiol increased eightfold in girls but only twofold in boys (Nottelmann & others, 1987). Thus, both testosterone and estradiol are present in the hormonal makeup of both boys and girls, but testosterone dominates in male pubertal development, estradiol in female pubertal development.

The same influx of hormones that grows hair on a male’s chest and increases the fatty tissue in a female’s breasts may also contribute to psychological development in adolescence (Susman & Dorn, 2009). In one study of boys and girls ranging in age from 9 to 14, a higher concentration of testosterone was present in boys who rated themselves as more socially competent (Nottelmann & others, 1987). However, hormonal effects by themselves do not account for adolescent development (Susman & Dorn, 2009). For example, in one study, social factors were much better predictors of young adolescent girls’ depression and anger than hormonal factors (Brooks-Gunn & Warren, 1989). Behavior and moods also can affect hormones (DeRose & Brooks-Gunn, 2008). Stress, eating patterns, exercise, sexual activity, tension, and depression can activate or suppress various aspects of the hormonal system (Sontag & others, 2008). In sum, the hormone-behavior link is complex.

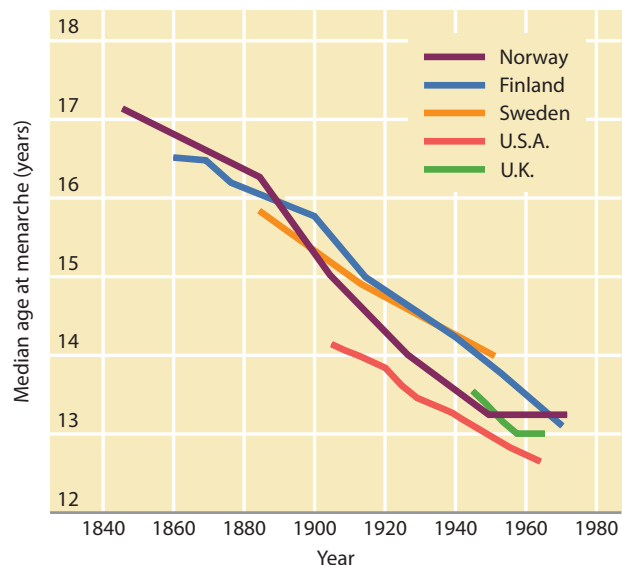
**developmental connection**  
**Life-span Perspective.** Biological, cognitive, and socioemotional processes interact in development. Chapter 1, p. 15

**Timing and Variations in Puberty** In the United States—where children mature up to a year earlier than children in European countries—the average age of menarche has declined significantly since the mid-19th century (see Figure 11.2). Fortunately, however, we are unlikely to see pubescent toddlers, since what has happened in the past century is likely the result of improved nutrition and health.

Why do the changes of puberty occur when they do, and how can variations in their timing be explained? The basic genetic program for puberty is wired into the species (Gajdos, Hirschhorn, & Palmert, 2009), but nutrition, health, and other environmental factors also affect puberty’s timing and makeup (Ji & Chen, 2008).

For most boys, the pubertal sequence may begin as early as age 10 or as late as 13½, and may end as early as age 13 or as late as 17. Thus the normal range is wide enough that, given two boys of the same chronological age, one might complete the pubertal sequence before the other one has begun it. For girls, menarche is considered within the normal range if it appears between the ages of 9 and 15. An increasing number of U.S. girls are beginning puberty at 8 and 9 years of age, with African American girls developing earlier than non-Latino White girls (Herman-Giddens, 2007).

**Precocious puberty** is the term used to describe the very early onset and rapid progression of puberty. Judith Blakemore and her colleagues (2009) recently described the following characteristics of precocious puberty. Precocious puberty is usually diagnosed when the onset of puberty happens before 8 years of age in girls and before 9 years of age in boys. Precocious puberty occurs about 10 times more often in girls than in boys. Precocious puberty usually is treated by medically suppressing gonadotropic secretions, which temporarily halts pubertal change. This treatment is usually given because children who experience precocious puberty are eventually likely to have short stature, early sexual capability, and the potential for engaging in age-inappropriate behavior (Blakemore, Berenbaum, & Liben, 2009).



**FIGURE 11.2**  
**MEDIAN AGES AT MENARCHE IN SELECTED NORTHERN EUROPEAN COUNTRIES AND THE UNITED STATES FROM 1845 TO 1969.** Notice the steep decline in the age at which girls experienced menarche in four northern European countries and the United States from 1845 to 1969. Recently the age at which girls experience menarche has been leveling off.

**precocious puberty** The very early onset and rapid progression of puberty.





Adolescents show a strong preoccupation with their changing bodies and develop images of what their bodies are like. *Why might adolescent males have more positive body images than adolescent females?*

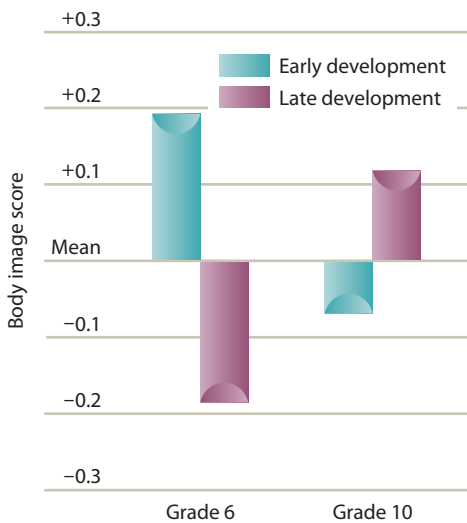
**Body Image** One psychological aspect of physical change in puberty is certain: Adolescents are preoccupied with their bodies and develop images of what their bodies are like (Mueller, 2009). Preoccupation with body image is strong throughout adolescence, but it is especially acute during early adolescence, a time when adolescents are more dissatisfied with their bodies than in late adolescence.

Gender differences characterize adolescents' perceptions of their bodies. In general, girls are less happy with their bodies and have more negative body images than boys throughout puberty (Bearman & others, 2006). As pubertal change proceeds, girls often become more dissatisfied with their bodies, probably because their body fat increases. In contrast, boys become more satisfied as they move through puberty, probably because their muscle mass increases.

**Early and Late Maturation** Some of you entered puberty early, others late, and still others on time. Adolescents who mature earlier or later than their peers perceive themselves differently (Susman & Dorn, 2009). In the Berkeley Longitudinal Study some years ago, early-maturing boys perceived themselves more positively and had more successful peer relations than did their late-maturing counterparts (Jones, 1965). When the late-maturing boys were in their thirties, however, they had developed a stronger sense of identity than the early-maturing boys had (Peskin, 1967). This may have occurred because the late-maturing boys had more time to explore life's options, or because the early-maturing boys continued to focus on their advantageous physical status instead of on career development and achievement. More recent research confirms, though, that at least during adolescence it is advantageous to be an early-maturing rather than a late-maturing boy (Graber, Brooks-Gunn, & Warren, 2006).

For girls, early and late maturation have been linked with body image. In the sixth grade, early-maturing girls show greater satisfaction with their figures than do late-maturing girls, but by the tenth grade late-maturing girls are more satisfied (Simmons & Blyth, 1987) (see Figure 11.3). One possible reason for this is that in late adolescence early-maturing girls are shorter and stockier, whereas late-maturing girls are taller and thinner. Thus, late-maturing girls in late adolescence have bodies that more closely approximate the current American ideal of feminine beauty—tall and thin.

An increasing number of researchers have found that early maturation increases girls' vulnerability to a number of problems (Cavanagh, 2009; Ge & Natsuaki, 2010). Early-maturing girls are more likely to smoke, drink, be depressed, have an eating disorder, struggle for earlier independence from their parents, and have older friends; and their bodies are likely to elicit responses from males that lead to earlier dating and earlier sexual experiences (Wiesner & Ittel, 2002). Early maturing girls also are less likely to graduate from high school and they cohabit and marry earlier (Cavanagh, 2009).



**FIGURE 11.3**  
**EARLY- AND LATE-MATURING ADOLESCENT GIRLS' PERCEPTIONS OF BODY IMAGE IN EARLY AND LATE ADOLESCENCE.**

The sixth-grade girls in this study had positive body image scores if they were early-maturers but negative body image scores if they were late-maturers (Simmons & Blyth, 1987). Positive body image scores indicated satisfaction with their figures. By the 10th grade, however, it was the late-maturers who had positive body image scores.

## THE BRAIN

Along with the rest of the body, the brain is changing during adolescence, but the study of adolescent brain development is in its infancy. As advances in technology take place, significant strides will also likely be made in charting developmental changes in the adolescent brain (Paus, 2009; Steinberg, 2009). What do we know now?

Recall from our discussion of the brain's development in Chapter 4 researchers' discovery that nearly twice as many synaptic connections are made than will ever

be used (Huttenlocher & Dabholkar, 1997). The connections that are used are strengthened and survive, while the unused ones are replaced by other pathways or disappear. That is, in the language of neuroscience, these connections will be “pruned.” What results from this pruning is that by the end of adolescence individuals have “fewer, more selective, more effective neuronal connections than they did as children” (Kuhn, 2009, p. 153). And this pruning indicates that the activities adolescents choose to engage in and not to engage in influence which neural connections will be strengthened and which will disappear.

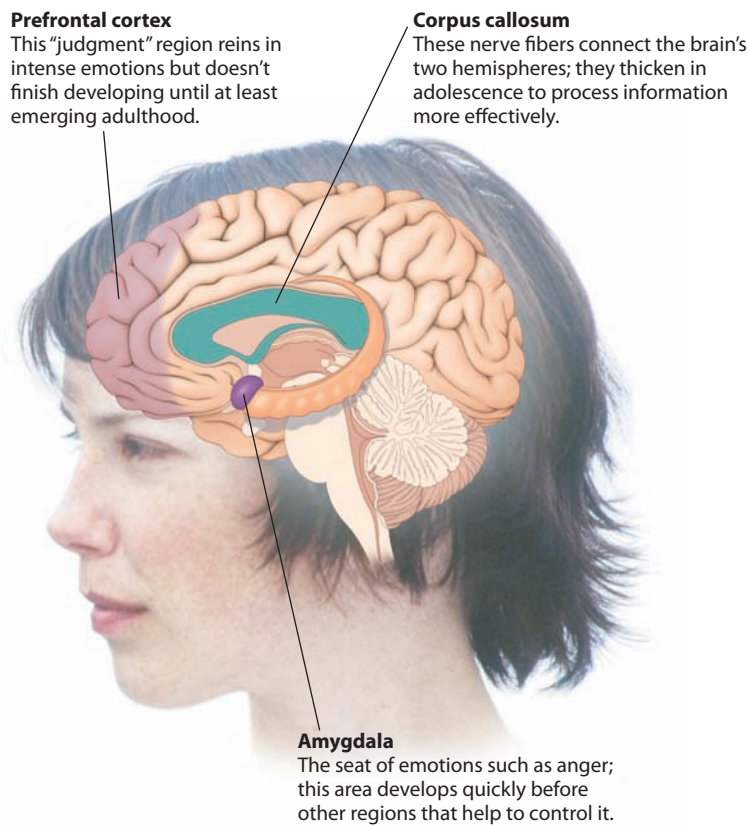
Using fMRI brain scans, scientists have recently discovered that adolescents’ brains undergo significant structural changes (Bava & others, 2010; Lenroot & others, 2009). The **corpus callosum**, where fibers connect the brain’s left and right hemispheres, thickens in adolescence, and this improves adolescents’ ability to process information (Giedd, 2008). We described advances in the development of the *prefrontal cortex*—the highest level of the frontal lobes involved in reasoning, decision making, and self-control—in Chapter 9. However, the prefrontal cortex doesn’t finish maturing until the emerging adult years, approximately 18 to 25 years of age, or later, whereas the **amygdala**—the seat of emotions such as anger—matures earlier than the prefrontal cortex. Figure 11.4 shows the locations of the corpus callosum, prefrontal cortex, and amygdala.

Many of the changes in the adolescent brain that have been described involve the rapidly emerging field of *social developmental neuroscience*, which involves connections between development, the brain, and socioemotional processes (de Haan & Gunnar, 2009). For example, consider leading researcher Charles Nelson’s (2003) view that, although adolescents are capable of very strong emotions, their prefrontal cortex hasn’t adequately developed to the point at which they can control these passions. It is as if their brain doesn’t have the brakes to slow down their emotions. Or consider this interpretation of the development of emotion and cognition in adolescents: “early activation of strong ‘turbo-charged’ feelings with a relatively unskilled set of ‘driving skills’ or cognitive abilities to modulate strong emotions and motivations” (Dahl, 2004, p. 18).

Of course, a major issue is which comes first, biological changes in the brain or experiences that stimulate these changes (Lerner, Boyd, & Du, 2008)? Consider a recent study in which the prefrontal cortex thickened and more brain connections formed when adolescents resisted peer pressure (Paus & others, 2007). Scientists have yet to determine whether the brain changes come first or whether the brain changes are the result of experiences with peers, parents, and others. Once again, we encounter the nature-nurture issue that is so prominent in an examination of development through the life span.

## ADOLESCENT SEXUALITY

Not only is adolescence characterized by substantial changes in physical growth and the development of the brain, but adolescence also is a bridge between the asexual child and the sexual adult. Adolescence is a time of sexual exploration and experimentation, of sexual fantasies and realities, of incorporating sexuality into one’s identity. Adolescents have an almost insatiable curiosity about sexuality. They are concerned about whether they are sexually attractive, how to do sex, and what the future holds for their sexual lives. Although most adolescents experience times of vulnerability and confusion, the majority will eventually develop a mature sexual identity. In the United States, the information about sexuality is widely available to



**FIGURE 11.4**  
**CHANGES IN THE ADOLESCENT BRAIN**

**developmental connection**

**Brain Development.** Although the prefrontal cortex shows considerable development in childhood, it is still not fully mature in adolescence. Chapter 9, p. 278

**Sexual arousal emerges as a new phenomenon in adolescence and it is important to view sexuality as a normal aspect of adolescent development.**

—**SHIRLEY FELDMAN**  
*Contemporary Psychologist, Stanford University*

**corpus callosum** The location where fibers connect the brain’s left and right hemispheres.

**amygdala** The region of the brain that is the seat of emotions.





Adolescents are exposed to sex virtually everywhere in the American culture and sex is used to sell just about everything.

adolescents. They learn a great deal about sex from television, videos, magazines, the lyrics of popular music, and Web sites (Epstein & Ward, 2008).

How might watching sex on television be linked to adolescents' sexual activity? A recent research review concluded that adolescents who view more sexual content on TV are more likely to initiate sexual intercourse earlier than their peers who view less sexual content on TV (Brown & Strasburger, 2007). Further, a recent study of adolescent girls across a three-year period revealed a link between watching sex on TV and subsequent higher risk of pregnancy (Chandra & others, 2008).

**Developing a Sexual Identity** Mastering emerging sexual feelings and forming a sense of sexual identity are multifaceted and lengthy processes (Diamond & Savin-Williams, 2009). They involve learning to manage sexual feelings (such as sexual arousal and attraction), developing new forms of intimacy, and learning the skills to regulate sexual behavior to avoid undesirable consequences. Developing a sexual identity also involves more than just sexual behavior. Sexual identities emerge in the context of physical factors, social factors, and cultural factors, with most societies placing constraints on the sexual behavior of adolescents.

An adolescent's sexual identity involves activities, interests, styles of behavior, and an indication of sexual orientation (whether an individual has same-sex or other-sex attractions) (Buzwell & Rosenthal, 1996). For example, some adolescents have a high anxiety level about sex, others a low level. Some adolescents are strongly aroused sexually, others less so. Some adolescents are very active sexually, others not at all. Some adolescents are sexually inactive in response to their strong religious upbringing; others go to church regularly, yet their religious training does not inhibit their sexual activity (Thorton & Camburn, 1989).

It is commonly thought that most gays and lesbians quietly struggle with same-sex attractions in childhood, do not engage in heterosexual dating, and gradually recognize that

they are a gay or lesbian in mid- to late adolescence. Many youth do follow this developmental pathway, but others do not (Diamond & Savin-Williams, 2009). For example, many youth have no recollection of early same-sex attractions and experience a more abrupt sense of their same-sex attraction in late adolescence. The majority of adolescents with same-sex attractions also experience some degree of other-sex attractions. Even though some adolescents who are attracted to individuals of their same sex fall in love with these individuals, others claim that their same-sex attractions are purely physical (Diamond & Savin-Williams, 2009).

In sum, gay and lesbian youth have diverse patterns of initial attraction, often have bisexual attractions, and may have physical or emotional attraction to same-sex individuals but do not always fall in love with them (Diamond & Savin-Williams, 2009). In Chapter 13, "Physical and Cognitive Development in Early Adulthood," we will further explore same-sex and heterosexual attraction.

### developmental connection

**Sexuality.** What characterizes the sexual activity of emerging adults (18 to 25 years of age)? Chapter 13, p. 425

**The Timing of Adolescent Sexual Behaviors** The timing of sexual initiation varies by country as well as by gender and other socioeconomic characteristics (Eaton & others, 2008). In one cross-cultural study, among females, the proportion having first intercourse by age 17 ranged from 72 percent in Mali to 47 percent in the United States and 45 percent in Tanzania (Singh & others, 2000). The



percentage of males who had their first intercourse by age 17 ranged from 76 percent in Jamaica to 64 percent in the United States and 63 percent in Brazil. Within the United States, male, African American, and inner-city adolescents report being the most sexually active, whereas Asian American adolescents are less likely to be sexually active (Feldman, Turner, & Araujo, 1999).

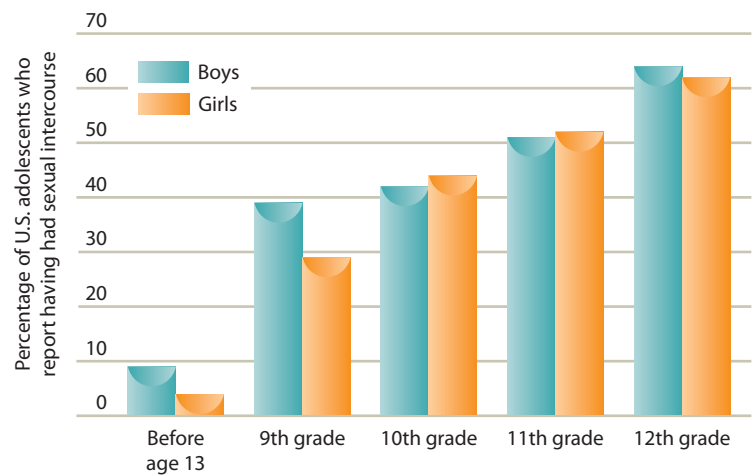
A national survey revealed that 63 percent of U.S. 12th-graders (64 percent of males, 62 percent of females) reported that they had experienced sexual intercourse compared with 34 percent of 9th-graders (39 percent of males, 29 percent of females) (MMWR, 2006) (see Figure 11.5). By age 20, 77 percent of U.S. youth have engaged in sexual intercourse (Dworkin & Santelli, 2007). A recent national study indicated that 35 percent of U.S. high school students were currently sexually active (Eaton & others, 2008). Another recent national study of adolescent sexual behavior from 1991 to 2007 revealed that sexual experience and having multiple sexual partners in adolescence declined from the early 1990s through the early 2000s, and then increased recently (Santelli & others, 2009).

There has been a dramatic increase in oral sex during adolescence (Brewster & Harker Tillman, 2008). In a national survey, 55 percent of U.S. 15- to 19-year-old boys and 54 percent of girls of the same age range said they had engaged in oral sex (National Center for Health Statistics, 2002). In the survey, more than 20 percent of the adolescents who had not had sexual intercourse had engaged in oral sex.

**Risk Factors in Adolescent Sexual Behavior** Many adolescents are not emotionally prepared to handle sexual experiences, especially in early adolescence. Early sexual activity is linked with risky behaviors such as drug use, delinquency, and school-related problems (Dryfoos & Barkin, 2006). A recent study revealed that alcohol use, early menarche, and poor parent-child communication were linked to early sexually intimate behavior in girls (Hipwell & others, 2010).

In addition to having sex in early adolescence, other risk factors for sexual problems in adolescence include contextual factors such as socioeconomic status (SES), as well as family/parenting, peer, and academic achievement factors (Dupere & others, 2008; House & others, 2010). The percentage of sexually active young adolescents is higher in low-income areas of inner cities (Silver & Bauman, 2006). Further, having older sexually active siblings or pregnant/parenting teenage sisters places adolescents at an elevated risk of adolescent pregnancy (Miller, Benson, & Galbraith, 2001). A recent research review found that earlier onset of sexual intercourse was linked to a lower level of parental monitoring (Zimmer-Gembeck & Helfand, 2008). In another study, maternal communication about sex (the extent mothers talked with their adolescents about having sexual intercourse and the negative things that could happen if he got someone pregnant/she got pregnant, for example) was linked with less risky sexual behavior by Latino adolescents (Trejos-Castillo & Vazonyi, 2009). Also, a recent study of middle school students revealed that better academic achievement was a protective factor in keeping boys and girls from engaging in early initiation of sexual intercourse (Lafin, Wang, & Barry, 2008).

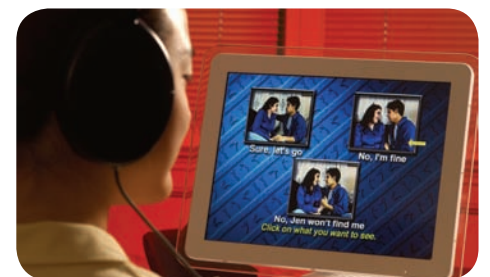
**Contraceptive Use** Sexual activity carries with it considerable risks if appropriate safeguards are not taken. Youth encounter two kinds of risks: unintended unwanted pregnancy and sexually transmitted infections. Both of these risks can be reduced significantly if contraception is used.



**FIGURE 11.5**  
TIMING OF SEXUAL INTERCOURSE IN U.S. ADOLESCENTS



*What are some risks for early initiation of sexual intercourse?*



Psychologists are exploring ways to encourage adolescents to make less risky sexual decisions. Here an adolescent participates in an interactive video session developed by Julie Downs and her colleagues at the Department of Social and Decision Making Sciences at Carnegie Mellon University. The videos help adolescents evaluate their responses and decisions in high-risk sexual contexts.

The good news is that adolescents are increasing their use of contraceptives (Frost, Darroch, & Ramez, 2008). For example, a recent large-scale study revealed a substantial increase in the use of contraceptives (61.5 percent in 2007 compared with 46.2 percent in 1991) by U.S. high school students during the last time they had sexual intercourse (among students who were sexually active) (Centers for Disease Control and Prevention, 2008).

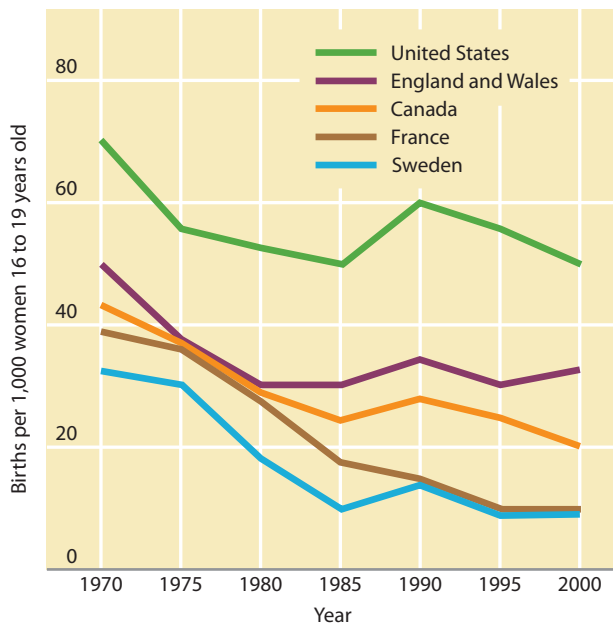
Although adolescent contraceptive use is increasing, many sexually active adolescents still do not use contraceptives, or they use them inconsistently (Parkes & others, 2009; Sterling & Saddler, 2009). Younger adolescents are less likely than older adolescents to take contraceptive precautions.

Researchers also have found that U.S. adolescents use condoms less than their counterparts in Europe. Recent studies of 15-year-olds revealed that in Europe 72 percent of the girls and 81 percent of boys used condoms at last intercourse (Currie & others, 2008); by comparison, in the U.S., 62 percent of the girls and 75 percent of the boys used condoms at last intercourse (Santelli, Sandfort, & Orr, 2009). Pill use also continues to be higher in European countries (Santelli, Sandfort, & Orr, 2009). Such comparisons provide insight into why adolescent pregnancy rates are much higher in the United States than in European countries.

### developmental connection

**Conditions, Diseases, and Disorders.** What are some good strategies for protecting against HIV and other sexually transmitted infections? Chapter 13, p. 429

**Sexually Transmitted Infections** Some forms of contraception, such as birth control pills or implants, do not protect against sexually transmitted infections, or STIs. **Sexually transmitted infections (STIs)** are contracted primarily through sexual contact, including oral-genital and anal-genital contact. Every year more than 3 million American adolescents (about one-fourth of those who are sexually experienced) acquire an STI (Centers for Disease Control and Prevention, 2008). In a single act of unprotected sex with an infected partner, a teenage girl has a 1 percent risk of getting HIV, a 30 percent risk of acquiring genital herpes, and a 50 percent chance of contracting gonorrhea (Glei, 1999). Yet another very widespread STI is chlamydia. In Chapter 13, we will consider these and other sexually transmitted infections.



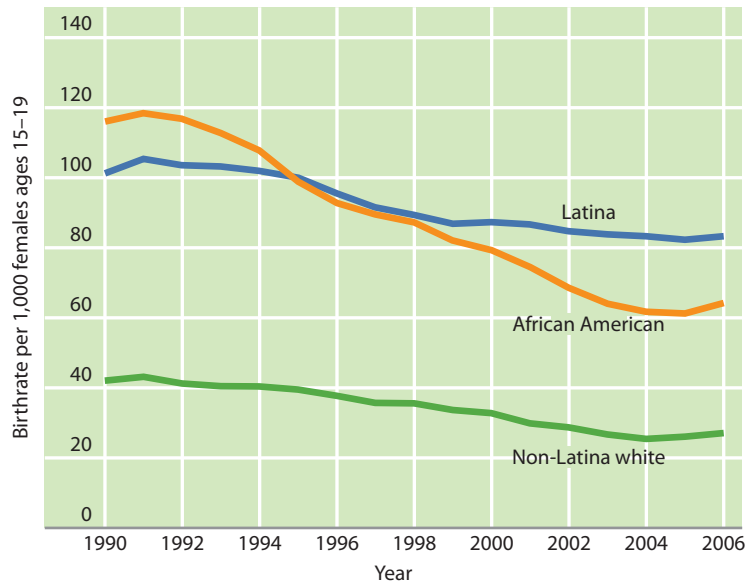
**FIGURE 11.6**  
**CROSS-CULTURAL COMPARISONS OF ADOLESCENT PREGNANCY RATES.** Pregnancy rates among U.S. adolescents are among the highest in the industrialized world (Centers for Disease Control and Prevention, 2002).

**Adolescent Pregnancy** In cross-cultural comparisons, the United States continues to have one of the highest adolescent pregnancy and childbearing rates in the industrialized world, despite a considerable decline in the 1990s (Cooksey, 2009). As Figure 11.6 shows, the U.S. adolescent pregnancy rate is five times as high as in Sweden. This dramatic difference exists in spite of the fact that U.S. adolescents are no more sexually active than their counterparts in Sweden.

Despite the negative comparisons of the United States with many other developed countries, there have been some encouraging trends in U.S. adolescent pregnancy rates. The rate of births to adolescent girls dropped 34 percent from 1991 to 2005. Reasons for these declines include increased contraceptive use and fear of sexually transmitted infections such as AIDS (Joyner, 2009). The adolescent birthrate then increased by 5 percent in 2005 and 2006, but resumed its downward trend in 2007 and 2008 (Hamilton, Martin, & Ventura, 2010) (see Figure 11.7).

Latina adolescents have a higher teen birthrate than non-Latina White and African American Adolescents (Santelli, Abraido-Lanza, & Melnikas, 2009). Latinas also have had the smallest recent declines in adolescent pregnancy and birthrates among ethnic groups in the United States (Ventura & others, 2008). Latina and African American adolescent girls who have a child are also more likely than non-Latina Whites to have a second child during adolescence (Rosengard, 2009).

Daughters of teenage mothers are also at risk for teenage childbearing, thus perpetuating an intergenerational cycle. A recent study using



**FIGURE 11.7**  
**U. S. ADOLESCENT BIRTHRATE BY ETHNICITY, 1990 TO 2006**



*What are some consequences of adolescent pregnancy?*

data from the National Longitudinal Survey of Youth revealed that daughters of teenage mothers were 66 percent more likely to become teenage mothers themselves (Meade, Kershaw, & Ickovics, 2008). In this study, risks that increased the likelihood that the daughters of teenage mothers would become pregnant included low parental monitoring and poverty.

**Outcomes** Adolescent pregnancy creates health risks for both the baby and the mother. Infants born to adolescent mothers are more likely to have low birth weights—a prominent factor in infant mortality—as well as neurological problems and childhood illness (Chedraui, 2008). Adolescent mothers also often drop out of school. Although many adolescent mothers resume their education later in life, they generally never catch up economically with women who postpone childbearing until their twenties. One longitudinal study found that the children of women who had their first birth during their teens had lower achievement test scores and more behavioral problems than did children whose mothers had their first birth as adults (Hofferth & Reid, 2002).

Though the consequences of America’s high adolescent pregnancy rate are cause for great concern, it often is not pregnancy alone that leads to negative consequences for an adolescent mother and her offspring. Adolescent mothers are more likely to come from low-SES backgrounds (Joyner, 2009). Many adolescent mothers also were not good students before they became pregnant (Malamitsi-Puchner & Boutsikou, 2006). However, not every adolescent female who bears a child lives a life of poverty and low achievement. Thus, although adolescent pregnancy is a high-risk circumstance, and adolescents who do not become pregnant generally fare better than those who do, some adolescent mothers do well in school and have positive outcomes.

Serious, extensive efforts are needed to help pregnant adolescents and young mothers enhance their educational and occupational opportunities (Key & others, 2008). Adolescent mothers also need help in obtaining competent child care and in planning for the future.

Adolescents can benefit from age-appropriate family-life education. Family and consumer science educators teach life skills, such as effective decision making, to adolescents. To read about the work of one family and consumer science educator, see *Connecting With Careers*. And to learn more about ways to reduce adolescent pregnancy, see *Connecting Development to Life*.

**sexually transmitted infections (STIs)** Infections that are contracted primarily through sexual contact, including oral-genital and anal-genital contact.



## connecting with careers

### Lynn Blankenship, Family and Consumer Science Educator

Lynn Blankenship is a family and consumer science educator. She has an undergraduate degree in this area from the University of Arizona. She has taught for more than 20 years, the last 14 at Tucson High Magnet School.

Blankenship was awarded the Tucson Federation of Teachers Educator of the Year Award for 1999–2000 and the Arizona Teacher of the Year in 1999.

Blankenship especially enjoys teaching life skills to adolescents. One of her favorite activities is having students care for an automated baby that imitates the needs of real babies. She says that this program has a profound impact on students because the baby must be cared for around the clock for the duration of the assignment. Blankenship also coordinates real-world work experiences and training for students in several child-care facilities in the Tucson area.



Lynn Blankenship (*center*) teaching life skills to students.

*For more information about what family and consumer science educators do, see page 46 in the Careers in Life-Span Development appendix.*

## connecting development to life

### Reducing Adolescent Pregnancy

One strategy for reducing adolescent pregnancy, called the Teen Outreach Program (TOP), focuses on engaging adolescents in volunteer community service and stimulates discussions that help adolescents appreciate the lessons they learn through volunteerism. In one study, 695 adolescents in grades 9 to 12 were randomly assigned to either a Teen Outreach group or a control group (Allen & others, 1997). They were assessed at both program entry and program exit nine months later. The rate of pregnancy was substantially lower for the Teen Outreach adolescents. These adolescents also had a lower rate of school failure and academic suspension.

Girls, Inc., has four programs that are intended to increase adolescent girls' motivation to avoid pregnancy until they are mature enough to make responsible decisions about motherhood (Roth & others, 1998). Growing Together, a series of five two-hour workshops for mothers and adolescents, and Will Power/Won't Power, a series of six two-hour sessions that focus on assertiveness training, are for 12- to 14-year-old girls. For older adolescent girls, Taking Care of Business provides nine sessions that emphasize career planning as well as information about sexuality, reproduction, and contraception. Health Bridge coordinates health and education services—girls can participate in this program as one of their club activities. Girls who participated in these programs were less likely to get pregnant than girls who did not participate (Girls, Inc., 1991).

The sources and the accuracy of adolescents' sexual information are linked to adolescent pregnancy. Adolescents can get information

about sex from many sources, including parents, siblings, schools, peers, magazines, television, and the Internet. A special concern is the accuracy of sexual information to which adolescents have access on the Internet.

Currently, a major controversy in sex education is whether schools should have an abstinence-only program or a program that emphasizes contraceptive knowledge (Hentz & Fields, 2009). Two recent research reviews found that abstinence-only programs do not delay the initiation of sexual intercourse and do not reduce HIV risk behaviors (Kirby, Laris, & Rolleur, 2007; Underhill, Montgomery, & Operario, 2007). Further, a recent study revealed that adolescents who experienced comprehensive sex education were less likely to report adolescent pregnancies than those who were given abstinence-only sex education or no education (Kohler, Manhart, & Lafferty, 2008). A number of leading experts on adolescent sexuality conclude that sex education programs that emphasize contraceptive knowledge do not increase the incidence of sexual intercourse and are more likely to reduce the risk of adolescent pregnancy and sexually transmitted infections than abstinence-only programs (Constantine, 2008; Eisenberg & others, 2008; Dworkin & Santelli, 2007; Hentz & Fields, 2009).

*Based on the information you read earlier about risk factors in adolescent sexual behavior, which segments of the adolescent population would benefit most from the types of sex education programs described here?*

## Review Connect Reflect

**LG2** Describe the changes involved in puberty as well as the changes in the brain and sexuality during adolescence.

### Review

- What are some key aspects of puberty?
- What changes typically occur in the brain during adolescence?
- What are some important aspects of sexuality in adolescence?

### Connect

- How might adolescent brain development be linked to adolescents'

decisions to or not to engage in sexual activity?

### Reflect Your Own Personal Journey of Life

- Did you experience puberty early or late? How did this timing affect your development?

## 3 Issues in Adolescent Health

**LG3**

Identify adolescent problems related to health, substance use and abuse, and eating disorders.

Adolescent Health

Substance Use and Abuse

Eating Disorders

Many health experts argue that whether adolescents are healthy depends primarily on their own behavior. To improve adolescent health, adults should aim to (1) increase adolescents' *health-enhancing* behaviors, such as eating nutritiously, exercising, wearing seat belts, and getting adequate sleep; and (2) reduce adolescents' *health-compromising* behaviors, such as drug abuse, violence, unprotected sexual intercourse, and dangerous driving.

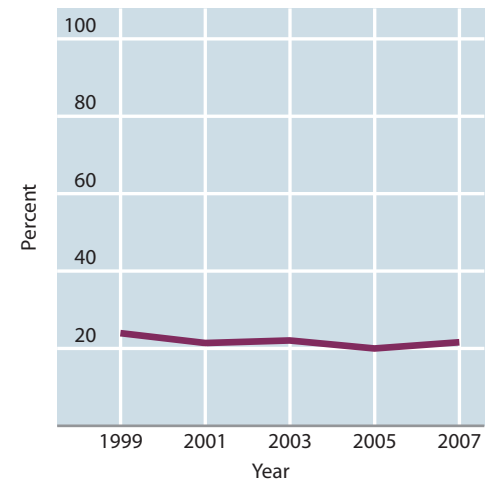
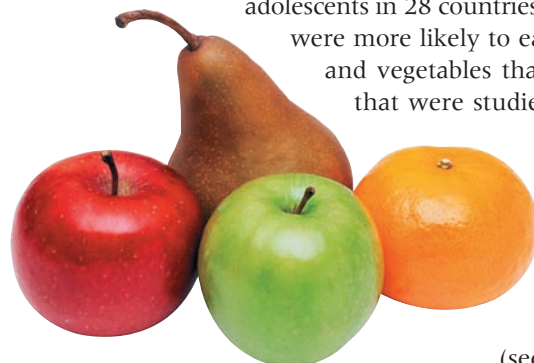
## ADOLESCENT HEALTH

Adolescence is a critical juncture in the adoption of behaviors that are relevant to health (Nyaronga & Wickrama, 2009; Ozer & Irwin, 2009). Many of the behaviors that are linked to poor health habits and early death in adults begin during adolescence. Conversely, the early formation of healthy behavior patterns, such as regular exercise and a preference for foods low in fat and cholesterol, not only has immediate health benefits but helps in adulthood to delay or prevent disability and mortality from heart disease, stroke, diabetes, and cancer (Schiff, 2009).

**Nutrition and Exercise** Concerns are growing about adolescents' nutrition and exercise (Biro & others, 2010; Frisco, 2009; Seo & Sa, 2010). The percentage of overweight U.S. 12- to 19-year-olds increased from 11 to 17 percent from the early 1990s through 2004 (Eaton & others, 2006). A recent study found that 80 percent of the male and 92 percent of the female adolescents in the 95th percentile and higher for body mass index (BMI) became obese adults (Wang & others, 2008). A comparison of adolescents in 28 countries found that U.S. and British adolescents

were more likely to eat fried food and less likely to eat fruits and vegetables than adolescents in most other countries that were studied (World Health Organization, 2000).

U.S. adolescents are decreasing their intake of fruits and vegetables. The National Youth Risk Survey found that U.S. high school students decreased their intake of fruits and vegetables from 1999 through 2007 (Eaton & others, 2008) (see Figure 11.8).



**FIGURE 11.8**  
**PERCENTAGE OF U.S. HIGH SCHOOL STUDENTS WHO ATE FRUITS AND VEGETABLES FIVE OR MORE TIMES A DAY, 1999 TO 2007.**

*Note:* The graph shows the percentage of high school students over time who had eaten fruits and vegetables (100% fruit juice, fruit, green salad, potatoes—excluding french fries, fried potatoes, or potato chips—carrots, or other vegetables) five or more times per day during the preceding seven days (Eaton & others, 2008).



What are some characteristics of adolescents' exercise patterns?

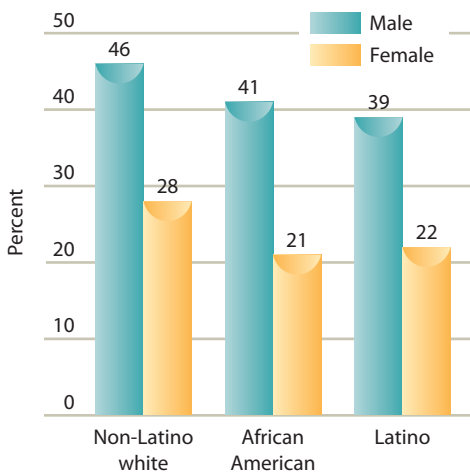
A special concern in American culture is the amount of fat in our diet (Frisco, 2009). Many of today's adolescents virtually live on fast-food meals, which contribute to the high fat levels in their diet. A longitudinal study revealed that frequent intake of fast food (three or more times a week) was reported by 24 percent of males and 21 percent of 15 year-old-females (Larson & others, 2008). At 20 years of age, the percent increased to 33 percent for males but remained at 21 percent for the females. And a recent study found that eating regular family meals during early adolescence was linked to healthy eating habits five years later (Burgess-Champoux & others, 2009).

Researchers have found that individuals become less active as they reach and progress through adolescence (Butcher & others, 2008). A recent national study revealed that only 31 percent of U.S. 15-year-olds met the federal government's moderate to vigorous exercise recommendations per day (a minimum of 60 minutes a day) and only 17 percent met the recommendations on weekends (Nader & others, 2008). The recent national study also found that adolescent boys were more likely to engage in moderate to vigorous exercise than were girls. Another national study of U.S. adolescents revealed that physical activity increased until 13 years of age in boys and girls but then declined through 18 years of age (Kahn & others, 2008).

Ethnic differences in exercise participation rates of U.S. adolescents also occur and these rates vary by gender. As indicated in Figure 11.9, in the National Youth Risk Survey non-Latino White boys exercised the most, African American girls the least (Eaton & others, 2008).

Exercise is linked to a number of positive physical outcomes in adolescence. One outcome is that regular exercise has a positive effect on adolescents' weight status (van der Heijden & others, 2010). A recent study revealed that regular exercise from 9 to 16 years of age was associated with regular weight in girls (McMurray & others, 2008). Other positive outcomes of exercise in adolescence are reduced triglyceride levels, lower blood pressure, and a lower incidence of type II diabetes (Butcher & others, 2008). A recent study revealed that low levels of exercise were related to depressive symptoms in young adolescents (Sund, Larsson, & Wichstrom, 2010). And another recent study found that vigorous physical activity was linked to lower drug use in adolescents (Delisle & others, 2010).

Watching television and using computers for long hours may be involved in lower levels of physical fitness in adolescence (Rey-Lopez & others, 2008). For example, a recent study revealed that the more frequently adolescents watched television and used computers, the less likely they were to engage in regular exercise (Chen, Liou, & Wu, 2008).



**FIGURE 11.9**  
**EXERCISE RATES OF U.S. HIGH SCHOOL STUDENTS: GENDER AND ETHNICITY.**

Note: Data are for high school students who were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes per day on five or more of the seven days preceding the survey.

**Sleep Patterns** Like nutrition and exercise, sleep is an important influence on well-being. Might changing sleep patterns in adolescence contribute to adolescents' health-compromising behaviors? Recently there has been a surge of interest in adolescent sleep patterns (Anderson & others, 2009; Brand & others, 2010; Mosseley & Gradisar, 2009; Wolfson, 2010).

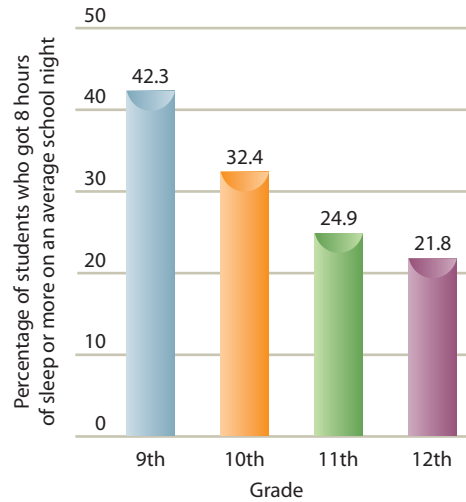
In a national survey of youth, only 31 percent of U.S. adolescents got eight or more hours of sleep on an average school night (Eaton & others, 2008). In this study, the percentage of adolescents getting this much sleep on an average school night decreased as they got older (see Figure 11.10).

The National Sleep Foundation (2006) conducted a U.S. survey of 1,602 caregivers and their 11- to 17-year-olds. Forty-five percent of the adolescents got inadequate sleep on school nights (less than eight hours). Older adolescents (9th- to 12th-graders) got markedly less sleep on school nights than younger adolescents (6th- to 8th-graders)—62 percent of the older adolescents got inadequate sleep compared to 21 percent of the younger adolescents. Adolescents who got inadequate sleep (eight hours or less) on school nights were more likely to feel more





In Mary Carskadon's sleep laboratory at Brown University, an adolescent girl's brain activity is being monitored. Carskadon (2005) says that in the morning, sleep-deprived adolescents' "brains are telling them it's night time . . . and the rest of the world is saying it's time to go to school" (p. 19).



**FIGURE 11.10**  
**DEVELOPMENTAL CHANGES IN U.S.**  
**ADOLESCENTS' SLEEP PATTERNS ON AN**  
**AVERAGE SCHOOL NIGHT**

tired or sleepy, more cranky and irritable, fall asleep in school, be in a depressed mood, and drink caffeinated beverages than their counterparts who got optimal sleep (nine or more hours).

Mary Carskadon and her colleagues (2004, 2006; Jenni & Carskadon, 2007; Tarokh & Carskadon, 2008) have conducted a number of research studies on adolescent sleep patterns. They found that when given the opportunity adolescents will sleep an average of 9 hours and 25 minutes a night. Most get considerably less than nine hours of sleep, however, especially during the week. This shortfall creates a sleep deficit, which adolescents often attempt to make up on the weekend. The researchers also found that older adolescents tend to be sleepier during the day than younger adolescents. They theorized that this sleepiness was not due to academic work or social pressures. Rather, their research suggests that adolescents' biological clocks undergo a shift as they get older, delaying their period of sleepiness by about one hour. A delay in the nightly release of the sleep-inducing hormone melatonin, which is produced in the brain's pineal gland, seems to underlie this shift. Melatonin is secreted at about 9:30 p.m. in younger adolescents and approximately an hour later in older adolescents.

Carskadon concludes that early school starting times may cause grogginess, inattention in class, and poor performance on tests. Based on her research, school officials in Edina, Minnesota, decided to start classes at 8:30 a.m. rather than the usual 7:25 a.m. Since then there have been fewer referrals for discipline problems, and the number of students who report being ill or depressed has decreased. The school system reports that test scores have improved for high school students, but not for middle school students. This finding supports Carskadon's suspicion that early start times are likely to be more stressful for older than for younger adolescents.

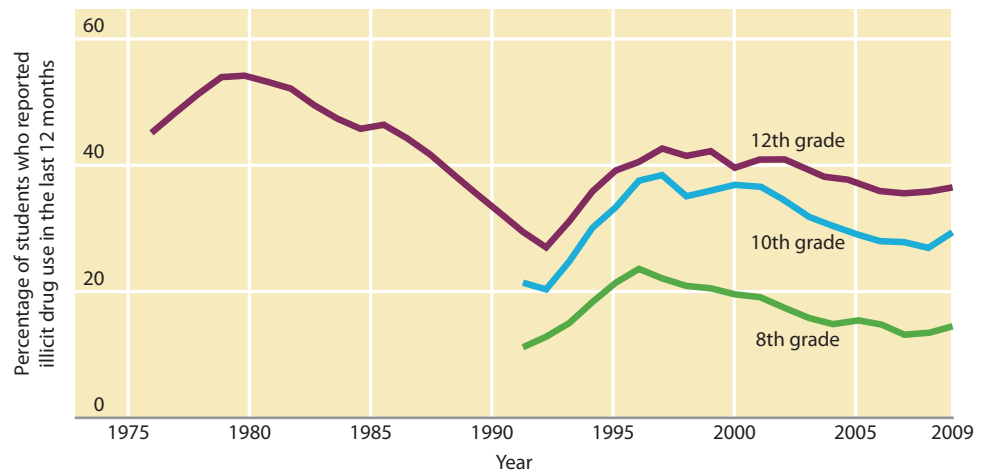
**Leading Causes of Death in Adolescence** The three leading causes of death in adolescence are accidents, homicide, and suicide (National Vital Statistics Reports, 2008). Almost half of all deaths from 15 to 24 years of age are due to unintentional injuries, approximately three-fourths of them involving motor vehicle accidents. Risky driving habits,



Students comfort each other in Canisteo, New York, at a memorial on the bridge where four adolescents from Jasper, New York were killed in a car crash in 2007.

## FIGURE 11.11

**TRENDS IN DRUG USE BY U.S. 8TH-, 10TH-, AND 12TH-GRADE STUDENTS.** This graph shows the percentage of U.S. 8th-, 10th-, and 12th-grade students who reported having taken an illicit drug in the last 12 months from 1991 to 2009, for 8th- and 10th-graders, and from 1975 to 2009, for 12th-graders (Johnston & others, 2010).



such as speeding, tailgating, and driving under the influence of alcohol or other drugs, may be more important contributors to these accidents than lack of driving experience (Dunlop & Romer, 2010; Shope, 2010). In about 50 percent of motor vehicle fatalities involving adolescents, the driver has a blood alcohol level of 0.10 percent—twice the level needed to be designated as “under the influence” in some states. A high rate of intoxication is also found in adolescents who die as pedestrians, or while using recreational vehicles.

Homicide is the second leading cause of death in adolescence (National Vital Statistics Reports, 2008), especially among African American males. Also notable is the adolescent suicide rate, which has tripled since the 1950s. Suicide accounts for 6 percent of the deaths in the 10 to 14 age group and 12 percent of deaths in the 15 to 19 age group. We will discuss suicide further in Chapter 12.

### developmental connection

**Substance Abuse.** Does substance abuse increase or decrease in emerging adulthood? Chapter 13, p. 422

## SUBSTANCE USE AND ABUSE

Each year since 1975, Lloyd Johnston and his colleagues at the Institute of Social Research at the University of Michigan have monitored the drug use of America’s high school seniors in a wide range of public and private high schools. Since 1991, they also have surveyed drug use by 8th- and 10th-graders. In 2009, the study surveyed more than 45,000 secondary school students (Johnston & others, 2010).

According to this study, the proportions of 8th-, 10th-, and 12th-grade U.S. students who used any illicit drug declined in the late 1990s and the first decade of the 21st century (Johnston & others, 2010) (see Figure 11.11). Nonetheless, even with the recent decline in use, the United States still has one of the highest rates of adolescent drug use of any industrialized nation.

How extensive is alcohol use by U.S. adolescents? Sizeable declines in adolescence alcohol use have occurred in recent years (Johnston & others, 2010). The percentage of U.S. eighth-graders saying that they had any alcohol to drink in the past 30 days fell from a 1996 high of 26 percent to 15 percent in 2009. The 30-day prevalence fell among 10th-graders from 39 percent in 2001 to 28 percent in 2009 and among high school seniors from 72 percent in 1980 to 43 percent in 2009. Binge drinking (defined in the University of Michigan surveys as having five or more drinks in a row in the last two weeks) by high school seniors declined from 41 percent in 1980 to 27 percent in 2009. Binge drinking by 8th- and 10th-graders also has dropped in recent years. A consistent sex difference occurs in binge drinking, with males engaging in this activity more than females.

A special concern is when adolescents drink and drive. In the University of Michigan Monitoring the Future Study, 30 percent of high school seniors said they had been in a vehicle with a drugged or drinking driver in the past two weeks (Johnston & others, 2008).



*What are some risk factors that predict whether adolescents will become regular smokers?*



Cigarette smoking among U.S. adolescents peaked in 1996 and 1997 and has gradually declined since then (Johnston & others, 2010). Following peak use in 1996, smoking rates for U.S. eighth-graders have fallen by 50 percent. In 2008, the percentages of adolescents who said they smoked cigarettes in the last 30 days were 20 percent (12th grade), 12 percent (10th grade), and 7 percent (8th grade).

Smoking is likely to begin in grades 7 through 9, although sizeable portions of youth are still establishing regular smoking habits during high school and college. Risk factors for becoming a regular smoker in adolescence include having a friend who smoked, a weak academic orientation, and low parental support (Tucker, Ellickson, & Klein, 2003).

An alarming recent trend is use of prescription painkillers by adolescents. A 2004 survey revealed that 18 percent of U.S. adolescents had used Vicodin at some point in their lifetime, and 10 percent had used OxyContin (Partnership for a Drug-Free America, 2005). These drugs fall into the general class of drugs called narcotics, and they are highly addictive. In this national survey, 9 percent of adolescents said they had abused cough medications to intentionally get high. Adolescents cite the medicine cabinets of their parents or of friends' parents as the main source for their prescription painkillers (Johnston & others, 2008).



What are some factors that contribute to whether adolescents engage in substance abuse?

**The Roles of Development, Parents, Peers, and Education** A special concern involves adolescents who begin to use drugs early in adolescence or even in childhood (Patrick, Abar, & Maggs, 2009). A longitudinal study of individuals from 8 to 42 years of age also found that early onset of drinking was linked to increased risk of heavy drinking in middle age (Pitkänen, Lyrä, & Pulkkinen, 2005).

Parents play an important role in preventing adolescent drug abuse (Chassin, Hussong, & Beltran, 2009; Harakeh & others, 2010; Hoffman, 2009; Miller & Plant, 2010). Researchers have found that parental monitoring is linked with a lower incidence of problem behavior by adolescents, including substance abuse (Fletcher, Steinberg, & Williams-Wheeler, 2004; Tobler & Komro, 2010). A recent research review found that the more frequently adolescents were at dinner with their family, the more likely they were to have fewer adolescent problems, including being less likely to have substance abuse problems (Sen, 2010). Another study of more than 5,000 middle school students revealed that having friends in their school's social network and having fewer friends who use substances were related to a lower level of substance use (Ennett & others, 2006).

Educational success is also a strong buffer for the emergence of drug problems in adolescence. A recent analysis by Jerald Bachman and his colleagues (2008) revealed that early educational achievement considerably reduced the likelihood that adolescents would develop drug problems, including alcohol abuse, smoking, and abuse of various illicit drugs. But what can families do to educate themselves and their children and reduce adolescent drinking and smoking behavior? To find out, see *Connecting Through Research*.

## EATING DISORDERS

Let's now examine two eating problems—anorexia nervosa and bulimia nervosa—that are far more common in adolescent girls than boys.

**Anorexia Nervosa** Although most U.S. girls have been on a diet at some point, slightly less than 1 percent ever develop anorexia nervosa. **Anorexia nervosa** is an eating disorder that involves the relentless pursuit of thinness through starvation.

**anorexia nervosa** An eating disorder that involves the relentless pursuit of thinness through starvation.