9 Motivation and Emotion

Chapter Outline

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The 3-week, 2,000-mile-plus Tour de France, the world's premier bicycle race, is one of the great tests of human motivation in sports. American Lance Armstrong won the Tour de France cycling event not just once, but five times from 1999 through 2003. This was a remarkable accomplishment, as Lance was diagnosed with testicular cancer in 1996. Chances of his recovery were estimated at less than 50 percent.

After the cancer was diagnosed, Lance said that the first thing he thought was, "Oh, no! My career's in jeopardy! Then, they kept finding new problems and I forgot about my career—I was more worried about getting to my next birthday. I had the same emotions when I was sick as I have as a competitive athlete. At first I was angry, then I felt motivated and driven to get better. And then when I knew I was getting better, I knew I was winning."

Lance's experience with cancer motivated him to think about his priorities in life. He says that the experience ultimately made him a happier and better person. He became a spokesperson for cancer and established the Lance Armstrong Foundation, which supports cancer awareness and research. He married and became a father.

When you are motivated, you do something. The way you feel—your emotions—can either strengthen or weaken your motivation. For Lance Armstrong, motivation and emotion played a significant role in his recovery and accomplishments:

- *Motivation.* The intense motivation required to make it through grueling practices, day after day; the motivation to battle cancer and defeat it; the motivation to set a goal of winning the Tour de France and then winning it; the motivation to improve his personal life by getting married and starting a family; and the motivation to donate his time and effort to promoting cancer research and awareness
- *Emotion.* The anger that emerged when he found out that he had cancer; the fear that he would die; the happiness of getting married and starting a family; and the elation and joy of winning the Tour de France

Motives and emotions are important in all our lives. They differ not only in kind, such as an individual being motivated to eat rather than have sex or feeling happy rather than angry, but also in intensity, such as an individual as being more or less hungry or more or less happy. This chapter looks at different approaches to motivation and emotion that have sought to explain why.

Lance Armstrong, after winning the Tour de France. *How were motivation and emotion involved in his effort?*

APPROACHES TO MOTIVATION 1

How do psychologists think about motivation?

We are all motivated, but we are motivated to do different things at different times. Some students are motivated to hang out with friends, others to get a head start on the week's assignment. **Motivation** moves people to behave, think, and feel the way they do. Motivated behavior is energized, directed, and sustained.

There is no shortage of theories about why organisms are motivated to do what they do. The following are the main approaches:

- *Evolutionary approach.* Early in psychology's history, the evolutionary approach emphasized the role of instincts in motivation. An **instinct** is an innate (unlearned), biological pattern of behavior that is assumed to be universal throughout a species. Psychologists crafted lists of instincts, some lists running to thousands of items. However, if we say that people have an instinct for sex or for curiosity or for acquisitiveness, we are merely naming the behaviors, not explaining them. However, some motivation seems to be unlearned. As chapter 3 explains, human infants come into the world equipped with a sucking instinct. Recently, evolutionary psychology has rekindled interest in the biological basis of motivation. Evolutionary psychologists argue that sex, aggression, achievement, and other behaviors are rooted in our evolutionary past (Buss, 2000, 2004; Cosmides & others, 2003). Thus, if a species is highly competitive, it is because such competitiveness improved the chance for survival and was passed down through the genes from generation to generation.
- *Drive reduction theory.* If you do not have an instinct for sex, maybe you have a drive or a need for it. A **drive** is an aroused state that occurs because of a physiological need. A **need** is a deprivation that energizes the drive to eliminate or reduce the deprivation. The body's need for food, for example, arouses your hunger drive. Hunger motivates you to do something—to go out for a hamburger, for example—to reduce the drive and satisfy the need. From this example, you might sense that drive pertains to a psychological state; need involves a physiological state. The goal of drive reduction is **homeostasis,** the body's tendency to maintain an equilibrium, or steady state. Literally hundreds of biological states in our bodies must be maintained within a certain range: temperature, blood sugar level, potassium and sodium levels, oxygen, and so on. When you dive into an icy swimming pool, your body uses energy to maintain its normal temperature. When you walk out of an air-conditioned room into the heat of a summer day, your body releases excess heat by sweating. These physiological changes occur automatically to keep your body in an optimal state of functioning. Today, homeostasis is used to explain both physical and psychological imbalances. Most psychologists believe that drive reduction theory does not provide a comprehensive framework for understanding motivation because people often behave in ways that increase rather than reduce a drive. For example, they might skip meals in an effort to lose weight, which can increase their hunger drive rather than reduce it.
- *Optimum arousal theory.* Some people seem more motivated to seek stimulation and thrills, perhaps by sky diving or driving too fast, than to reduce a drive. But is there an optimum level of arousal that motivates behavior? Since early in the twentieth century, some psychologists have believed that performance is generally better under conditions of moderate arousal than either low or high arousal. At the low end of arousal, you might be too lethargic to perform tasks well; at the high end, you may not be able to concentrate. Think about performance in sports. A thumping heart and rapid breathing have accompanied many golfers' missed putts and basketball players' failed free-throw attempts. But if athletes' arousal is too low, they may not concentrate well on the task

motivation Gives behavior, thoughts, and feelings a purpose and makes behavior energized, directed, and sustained.

instinct An innate (unlearned), biological pattern of behavior that is assumed to be universal throughout a species.

drive An aroused state that occurs because of a physiological need.

need A deprivation that energizes the drive to eliminate or reduce the deprivation.

homeostasis The body's tendency to maintain an equilibrium, or steady state.

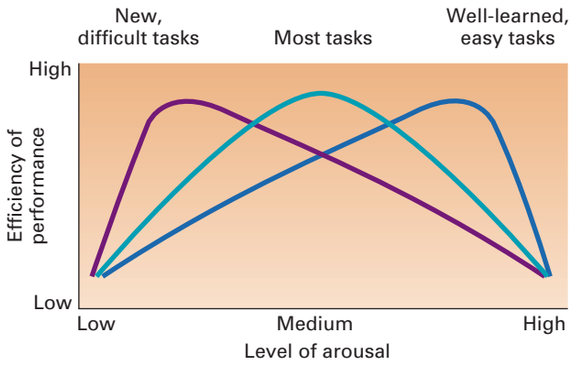


FIGURE 9.1 Arousal and Performance Optimal performance occurs with moderate arousal. However for well-learned, easy tasks, high arousal may be best. And for new or difficult tasks, low arousal may facilitate performance. As tasks become more difficult, the ability to be alert and attentive, but relaxed, is critical.

at hand. Low or high arousal sometimes produces optimal performance, however. For well-learned or simple tasks (signing your name, pushing a button on request), optimal arousal may be quite high. In contrast, when learning a task or doing something complex (solving an algebraic equation), much lower arousal is preferred. Figure 9.1 projects how arousal might influence easy, moderate, and difficult tasks. Also, some people, *sensation seekers,* crave a great deal of stimulation in their lives and enjoy the thrill of engaging in risky behavior. Zuckerman and his colleagues (Zuckerman 1994, 2000; Zuckerman & others, 1993) have found that high sensation seekers are more likely than low sensation seekers to engage in risky sports, such as mountain climbing, parachuting, hang gliding, scuba diving, car and motorcycle racing, and downhill skiing; to be attracted to vocations involving exciting experiences, such as firefighting, emergency-room work, and air traffic control; to drink heavily, smoke, and use illicit drugs; and to have a short-term hedonistic attitude toward intimate relationships and engage in more varied sexual activities with more partners.

- *Cognitive approach.* Freud's legacy to contemporary psychodynamic theory is the belief that we are largely unaware of why we behave the way we do: why we love someone, why we eat so much, why we are so aggressive, or why we are so shy. In contrast, cognitive psychologists tend to emphasize that human beings are rational and aware of their motivation. Humanistic theorists also stress our ability to examine our lives and become aware of what motivates us. Further, an important aspect of the cognitive approach to motivation is **intrinsic motivation,** which is based on internal factors, such as self-determination, curiosity, challenge, and effort. **Extrinsic motivation** is based on external incentives, such as rewards and punishments. Some students study hard because they are internally motivated to put forth considerable effort and achieve high quality in their work (intrinsic motivation). Other students study hard because they want to make good grades or avoid parental disapproval (extrinsic motivation). Research often reveals that people whose motivation is intrinsic show more interest, excitement, and confidence in what they are doing than those whose motivation is extrinsic. Intrinsic motivation often results in improved performance, persistence, creativity, and self-esteem (Deci & Ryan, 1995; Ryan & Deci, 2000, 2001; Sheldon & others, 1997). Apparently, self-determination (which is intrinsic) produces a sense of personal control that benefits the individual (deCharms, 1984; Deci & Ryan, 1994; Ryan & Deci, 2000, 2001). Researchers have found, for instance, that students' internal motivation and intrinsic interest in school tasks increase when they have some choice and some opportunities to take responsibility for their learning (Eccles, 2004; Eccles & Wigfield, 2002; Stipek, 2001). Some psychologists stress that many highly successful individuals are both intrinsically motivated (have a high personal standard of achievement and emphasize personal effort) and extrinsically

intrinsic motivation A motivation based on internal factors, such as self-determination, curiosity, challenge, and effort.

extrinsic motivation A motivation that involves external incentives, such as rewards and punishments.

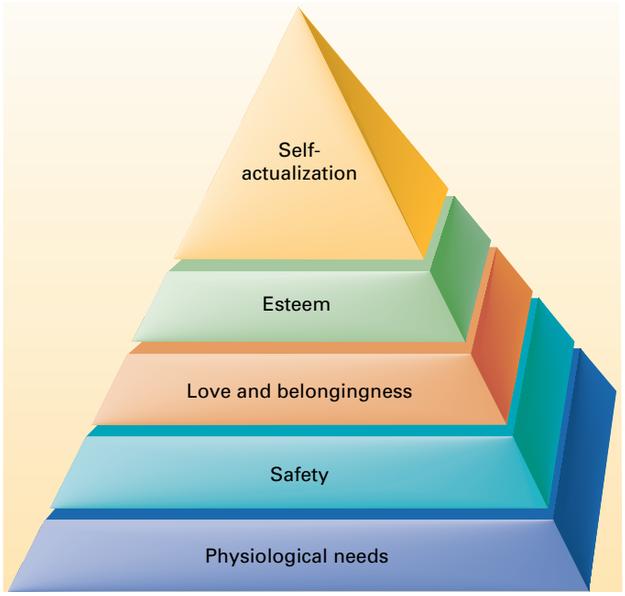


FIGURE 9.2 Maslow's Hierarchy of Needs Abraham Maslow developed the hierarchy of human needs to show that we have to satisfy basic physiological needs before we can satisfy other, higher needs.

motivated (are highly competitive). Lance Armstrong is a good example. For the most part, though, psychologists believe that intrinsic motivation is the key to achievement. Armstrong, like many other athletic champions, decided early on that he was training and racing for himself, not for his parents, his coaches, or the medals.

- *Maslow's hierarchy of human needs.* According to the humanistic theorist Abraham Maslow (1954, 1971), our basic needs must be satisfied before our higher needs can become motivating. Maslow's **hierarchy of needs** states that individuals' main needs are satisfied in the sequence shown in figure 9.2. According to this hierarchy, people are motivated to satisfy their need for food (a physiological need) first, their need for safety must be satisfied before their need for love, and so on. **Self-actualization,** the highest and most elusive of Maslow's needs, is the motivation to develop one's full potential as a human being. According to Maslow, self-actualization is possible only after the other needs in the hierarchy are met. Maslow cautions that most people stop maturing after they have developed a high level of esteem and thus do not become self-actualized. (Self-actualization is discussed further in chapter 10 and in the video clip "Self-Actualization.") The idea that human motives are hierarchically arranged is an appealing one. Maslow's theory stimulates us to think about the ordering of motives in our own lives. However, the ordering is somewhat subjective. Some people might seek advancement in a career to achieve self-esteem while putting on hold their needs for love and belongingness.

Review and Sharpen Your Thinking

1 ***Describe five psychological views of motivation.***

- Explain the evolutionary approach to motivation, drive reduction theory, optimum arousal theory, the cognitive approach, and Maslow's hierarchy of human needs.

Advertisers often draw on Maslow's hierarchy of human needs to sell their products. Look through some magazine advertisements for evidence of Maslow's hierarchy.

hierarchy of needs Maslow's view that individuals' main needs are satisfied in the following sequence: physiological, safety, love and belongingness, esteem, and self-actualization.

self-actualization The highest and most elusive of Maslow's needs; the development of one's full potential as a human being.

2 HUNGER

Biology of Hunger | Dieting | Obesity and Overeating | Eating Disorders

Why do people eat, and why do they eat too much or too little?
As Maslow's hierarchy indicates, hunger is a very basic human need and a powerful motivator. Food is an important aspect of life in all cultures. Whether we have very little or large amounts of food available to us, hunger influences our behavior. We have to eat to stay alive. What mechanisms cause us to feel hungry?

Biology of Hunger

You are sitting in class and it is 2 P.M. You were so busy today that you skipped lunch. As the professor lectures, your stomach starts to growl, and you start feeling a little groggy. What role, if any, do such signals play in hunger?

Gastric Signals In 1912, Walter Cannon and A. L. Washburn conducted an experiment that revealed a close association between stomach contractions and hunger. As part of the procedure, a partially inflated balloon was passed through a tube inserted in Washburn's mouth and pushed down into his stomach (see figure 9.3). A machine that measures air pressure was connected to the balloon to monitor Washburn's stomach contractions. Every time Washburn reported hunger pangs, his stomach was also contracting. This finding, which was confirmed in subsequent experiments with other volunteers, led the two researchers to believe that gastric activity was the basis for hunger.

Stomach signals are not the only factors that affect hunger, however. People whose stomachs have been surgically removed still get hunger pangs.

The stomach can also send signals that stop hunger. We all know that a full stomach can decrease our appetite. In fact, the stomach actually tells the brain not only how full it is but also how much nutrient is present. That is why rich food stops your hunger faster than the same amount of water. A hormone, cholecystokinin, helps start the digestion of food, then travels to the brain through the bloodstream, and signals you to stop eating (Naslund, Hellstrom, & Krail, 2001).

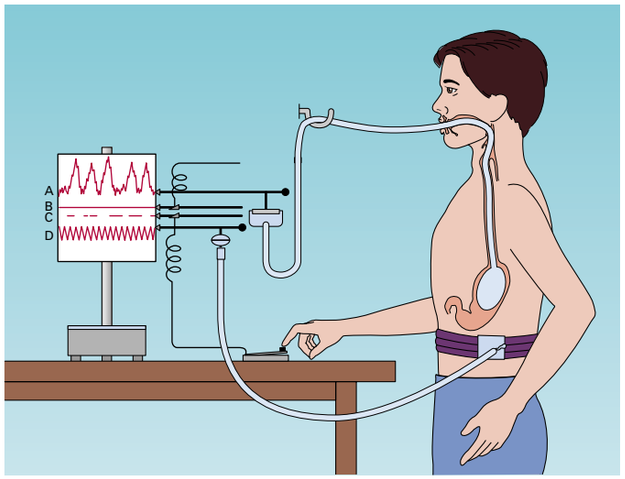


FIGURE 9.3 Cannon and Washburn's Classic Experiment on Hunger In this experiment, the researchers demonstrated that stomach contractions, which were detected by the stomach balloon, accompany a person's hunger feelings, which were indicated by pressing the key. Line A in the chart records increases and decreases in the volume of the balloon in the participant's stomach. Line B records the passage of time. Line C records the participant's manual signals of feelings of hunger. Line D records a reading from the belt wrapped around the participant's waist to detect movements of the abdominal wall and ensure that such movements are not the cause of changes in stomach volume.

Blood Chemistry There is a lot more involved in hunger than an empty stomach. Three important chemical substances are involved:

- *Glucose* (blood sugar) is an important factor in hunger, probably because the brain is critically dependent on sugar for energy. One set of sugar receptors, located in the brain itself, triggers hunger when sugar levels fall too low. Another set of sugar receptors is in the liver, which stores excess sugar and releases it into the blood when needed. The sugar receptors in the liver signal the brain when its sugar supply falls, and this signal can make you hungry.
- *Insulin,* a hormone, causes excess sugar in the blood to be stored in cells as fats and carbohydrates (Laboure

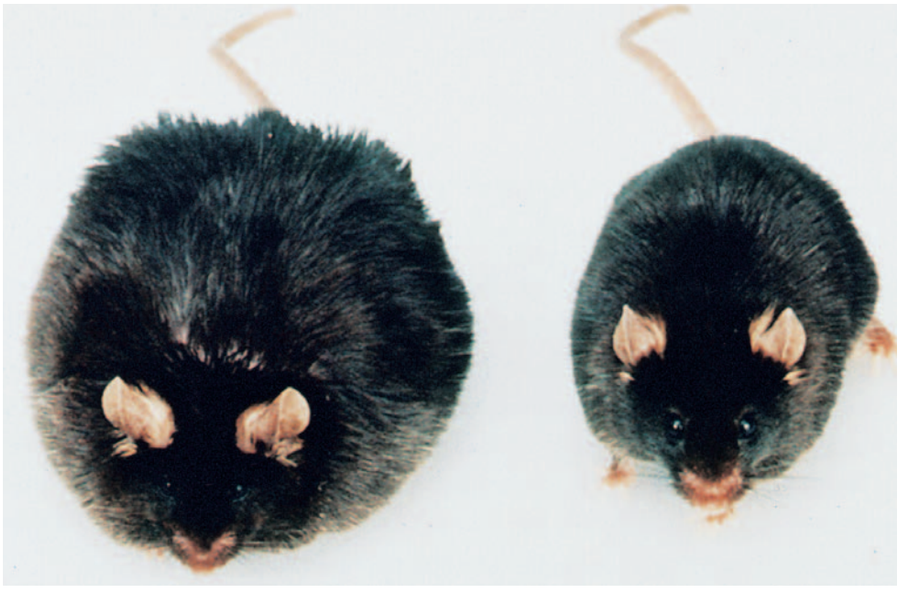


FIGURE 9.4 Leptin and Obesity The genetically obese *ob* mouse on the left is untreated; the one on the right has been given injections of leptin.

& others, 2002). Insulin injections cause profound hunger because they lower blood sugar drastically. Psychologist Judith Rodin (1984) has investigated the role of insulin and glucose in hunger and eating behavior. She has pointed out that, when we eat complex carbohydrates, such as cereals, bread, and pasta, insulin levels go up and then fall off gradually. When we consume simple sugars, such as candy bars and soft drinks, insulin levels rise and then fall off sharply—the all-too-familiar "sugar low." Glucose levels in the blood are affected by complex carbohydrates and simple sugars in similar ways. The consequence is that we are more likely to feel hungry within the next several hours after eating simple sugars than after eating complex carbohydrates. And the food we eat at one meal often influences how much we will eat at our next meal. Thus, consuming doughnuts and candy bars, which provide no nutritional value, sets up an ongoing sequence of what and how much we probably will crave the next time we eat.

- *Leptin* (from the Greek word *leptos*, which means "thin") is involved in *satiety* (the sense of being full and not wanting to eat more). Leptin, a protein that is released by fat cells, decreases food intake and increases energy expenditure (Mito & others, 2004; Oberbauer & others, 2001). Leptin strongly affects metabolism and eating, acting as an antiobesity hormone (Misra & others, 2001). The role of leptin in long-term satiety was discovered in *ob mice*, a strain of genetically obese mice (Campfield & others, 1995; Carlson, 2001). The *ob* mouse has a low metabolism, overeats, and gets extremely fat. Because of a genetic mutation, the fat cells of *ob* mice cannot produce leptin. If *ob* mice are given daily injections of leptin, their metabolic rate increases, they become more active, and they eat less. Consequently, their weight falls to a normal level. Figure 9.4 shows an untreated *ob* mouse and an *ob* mouse that has received injections of leptin. In humans, leptin concentrations have been linked with weight, percentage of body fat, weight loss in a single diet episode, and cumulative percentage of weight loss in all diet episodes (Benini & others, 2001; van Dielen & others, 2002). Scientists are interested in the possibility that leptin can help obese individuals lose weight (Wauters & others, 2001).

Brain Processes Chapter 2 described the central role of the hypothalamus in regulating important body functions, including hunger. More specifically, activity in two areas of the hypothalamus contributes to our understanding of hunger. The *lateral*

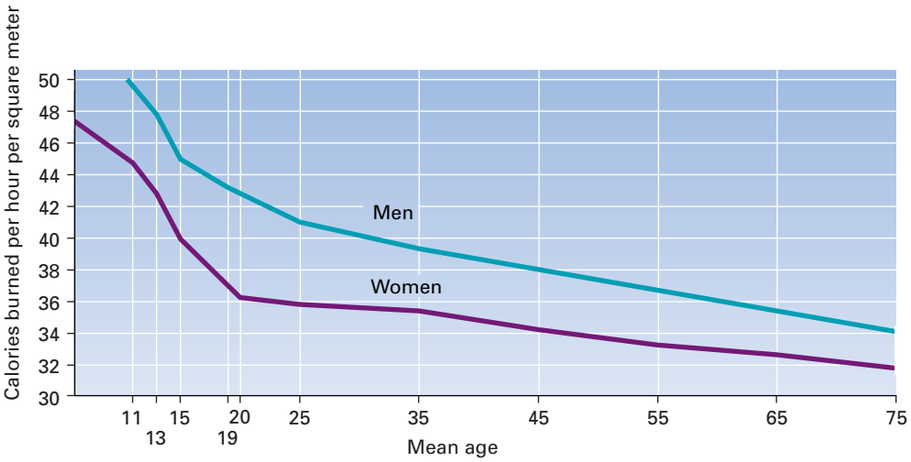


FIGURE 9.5 Changes in Basal Metabolism Rate with Age BMR varies with age and sex. Rates are usually higher for males and decline proportionately with age for both sexes.

hypothalamus is involved in stimulating eating. When it is electrically stimulated in a well-fed animal, the animal begins to eat. And if this area of the hypothalamus is destroyed, even a starving animal will show no interest in food. The *ventromedial hypothalamus* is involved in reducing hunger and restricting eating. When this area of an animal's brain is stimulated, the animal stops eating. When the area is destroyed, the animal eats profusely and quickly becomes obese.

Today, neuroscientists believe that much more of the brain helps in determining hunger than these on/off centers in the hypothalamus. They are exploring how neurotransmitters and neural circuits (clusters of neurons that often involve different parts of the brain) function in hunger.

Leptin influences eating by inhibiting the production of a neurotransmitter in the lateral hypothalamus that induces eating (Cowley & others, 2001; Sorensen & others, 2002a). The neurotransmitter serotonin is partly responsible for satiety, and drugs that block serotonin have been used to treat obesity in humans (Halford & Blundell, 2000; Thrybom, Rooth, & Lindstrom, 2001). Neural circuits involved in the action of such drugs may be in the brain stem, as well as in the hypothalamus (Carlson, 2001). The neural circuitry also extends to the cerebral cortex, where humans make decisions about whether to eat.

Obesity and Overeating

Approximately one-third of the American population is overweight enough to be at increased risk for health problems such as hypertension, cardiovascular disease, and diabetes. The health care costs linked to obesity are estimated to be $46 billion per year in the United States alone. And the rate of obesity is increasing: During the 1990s, the prevalence of obesity in the United States rose 8 percent (Friedman & Brownell, 1998). Obesity often becomes more common with increased age, especially among women (Engeland & others, 2004). Thus, as baby boomers age, the number of obese individuals is likely to increase.

Why do so many Americans overeat to the point of being obese? As is the case with much behavior, biological, cognitive, and sociocultural factors interact in diverse ways in different individuals, making it difficult to point to a specific cause. Let's look at some of the factors that are known to contribute to overeating, beginning with the biological causes.

Biology of Overeating Until recently, the genetic component of obesity was underestimated. As discussed earlier, scientists discovered an *ob* gene in mice that controls the production of leptin. In the 1990s, a similar gene was found in humans.

Some individuals do inherit a tendency to be overweight (Dancott & others, 2003; Yanovski & Yanovski, 2002). Only 10 percent of children who do not have obese parents become obese themselves, whereas 40 percent of children who have one obese parent become obese, and 70 percent of children who have two obese parents become obese. Researchers also have documented that animals can be inbred to have a propensity for obesity (Blundell, 1984). Further, identical human twins have similar weights, even when they are reared apart. Estimates of the degree to which heredity can explain obesity range from 25 to 70 percent.

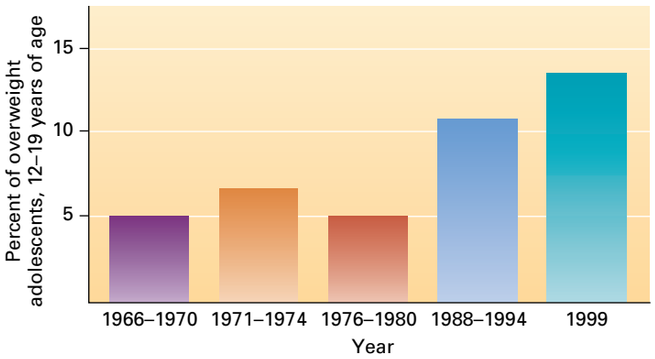


FIGURE 9.6 Increase in Adolescent Obesity in the United States

Another factor in weight is **basal metabolism rate (BMR),** the minimal amount of energy an individual uses in a resting state. BMR varies with age and sex. It declines precipitously during adolescence and then more gradually in adulthood. It also is slightly higher for males than for females. Many people gradually increase their weight over many years. To some degree, this weight gain can be due to a declining basal metabolism rate (see figure 9.5).

Set point, the weight maintained when no effort is made to gain or lose weight, is determined in part by the amount of stored fat in the body. Fat is stored in *adipose cells,* or fat cells. When these cells are filled, you do not get hungry. When people gain weight, the number of their fat cells increases. A normal-weight individual has 30 to 40 billion fat cells. An obese individual has 80 to 120 billion fat cells. Consequently, an obese individual has to eat more to feel satisfied. Some scientists have proposed that fat cells may shrink but might not go away.

Researchers have found that a high-fat diet may raise a person's set point for body weight (Frederich & others, 1995). They also have found that exercise can lower the body's set point for weight and contribute to weight loss (Jakicic, 2003; Rosenbaum, Leibel, & Hirsch, 1997).

Cognitive and Sociocultural Factors in Overeating Not too long ago, we believed that obesity was caused by eating in response to such factors as unhappiness or external food cues. But, according to Judith Rodin (1984), a number of biological, cognitive, and social factors are more important than emotional state and external stimuli. We already discussed some biological factors, including heredity, chemical substances, and brain processes.

In regard to cognitive and social factors, Rodin says that many people who respond to external cues also have the conscious ability to control their behavior and keep environmental food cues from controlling their eating patterns. Time and place do affect our eating, though. For example, when it is noon we are likely to feel hungry even if we have had a big breakfast and snacked at midmorning. We also associate eating with certain places. Many people link watching television with food and feel uncomfortable if they aren't eating something while they are watching TV.

Strong evidence of the environment's influence on weight is the doubling of the rate of obesity in the United States since 1900. Also, as shown in figure 9.6, obesity among adolescents in the United States has increased significantly since the late 1960s (National Center for Health Statistics, 2000b). Americans are more obese than Europeans and people in many other areas of the world.

The American culture provides substantial opportunities and encouragement for overeating. Food is everywhere you go, and it is easily accessed—in vending machines, at fast-food restaurants, at school or work. Nowhere else in the world will you find as many fast-food restaurants. Also, both portion size and the quantity of food that people eat at mealtime in the United States have grown. For example, fast-food restaurants give you the opportunity to "super-size" your meal at a relatively low additional cost. Also, a higher percentage of our food is made up of fat content than in the past. And, although we talk a lot about exercise, there is good evidence

basal metabolism rate (BMR) The minimal amount of energy an individual uses in a resting state.

set point The weight maintained when no effort is made to gain or lose weight.

Judith Rodin *(center)* has had a distinguished research and teaching career in psychology, and she became the first female president of an Ivy League university—the University of Pennsylvania—in 1993. She says that, as an undergraduate student at the University of Pennsylvania, she "fell in love with the field of psychology." In her book *Body Traps* (1993), Rodin argues that our society has constructed a number of psychological traps for women, such as the dieting rituals trap, which involves unrealistic expectations. She believes that too often women fall into the body traps of using goods and being thin as the measure of their self-worth. *What do you suppose Rodin means by "dieting rituals"?*

that Americans overall are getting less exercise than they did in the past (National Center for Health Statistics, 2000). In sum, an abundance of food in a culture that encourages food consumption, an increase in the amount of food eaten, a higher percentage of fat content in the food we eat, and a decrease in exercise add up to a population that has a serious number of overweight and obese individuals.

Dieting

Ironically, even as obesity is on the rise, dieting has become an obsession with many Americans. Many people spend their lives on one long diet, interrupted by occasional hot fudge sundaes or chocolate chip cookies. They are *restrained eaters,* individuals who chronically restrict their food intake to control their weight (Drobes & others, 2001). Restrained eaters are very conscious of what they eat and tend to feel guilty after splurging on sweets (Mulvihill, Davies, & Rogers, 2002). An interesting characteristic of restrained eaters is that, when they stop dieting, they tend to binge eat—that is, to eat large quantities of food in a short time (McFarlane, Polivy, & Herman, 1998).

The topic of dieting is of great interest to many others in the United States, including the public, health professionals, policy makers, the media, and the powerful diet and food industries. On one side are the societal norms that promote a lean body. This ideal is supported by $30 billion a year in sales of diet books, programs, videos, foods, and pills. On the other side are health professionals. Although they are alarmed by the rate of obesity, they are frustrated by high relapse rates and the widespread obsession with excessive thinness that can lead to chronic dieting and serious health risks.

Although many Americans regularly embark on diets, few are successful in keeping weight off in the long run. Whether some diet programs work better than others is still an open question. What we do know about losing weight is that the most effective programs include an exercise component (Sothern & others, 2002). Exercise not only burns calories but also continues to elevate the person's metabolic rate for several hours after the exercise. Also, exercise lowers a person's set point for weight, which makes it easier to maintain a lower weight (Bennett & Gurin, 1982).

Many people who are on diets should not be. A 10 percent reduction in body weight might produce striking benefits for an older, obese, hypertensive man yet be unhealthy for a female college student who is not overweight. The pressure to be thin, and thus to diet, is greatest among young women, yet they do not have the highest risk for obesity.

Diets may also place the dieter at risk for health problems. Listen to the audio clip "Teenage Dieting" to learn about the negative side effects of certain diets. One concern is weight cycling (commonly called "yo-yo dieting"), in which the person is in a recurring cycle of dieting and weight gain (Wadden & others, 1996). Researchers have found a link between frequent changes in weight and chronic disease (Brownell & Rodin, 1994). Also, liquid diets and other very low calorie strategies are related to gallbladder damage. But when overweight people diet and maintain their weight loss, they become less depressed and reduce their risk for a number of disorders that threaten their health and even their life (Christensen, 1996).

Eating Disorders

This section examines two major eating problems, anorexia nervosa and bulimia nervosa. Both are more common in young women than in any other gender-age segment of the population.

Anorexia Nervosa

Anorexia nervosa is an eating disorder that involves the relentless pursuit of thinness through starvation. Anorexia nervosa can eventually lead to death. The main characteristics of anorexia nervosa are (Davison & Neale, 2001)

- Weighing less than 85 percent of what is considered normal for age and height
- Having an intense fear of gaining weight that does not decrease with weight loss
- Having a distorted body image (Dohm & others, 2001). Even when individuals with anorexia nervosa are extremely thin, they see themselves as fat, especially in the abdomen, buttocks, and thighs. They never think they are thin enough: They weigh themselves frequently, often take their body measurements, and gaze critically at themselves in mirrors.

Anorexia nervosa typically begins in the teenage years, often following an episode of dieting and some type of life stress (Lewinsohn, Striegel-Moore, & Seeley, 2000). About 10 times more females than males have anorexia nervosa. Although most U.S. adolescent girls go on diets at some point, less than 1 percent develop anorexia nervosa (Walters & Kendler, 1994). When anorexia nervosa does occur in males, its symptoms and other characteristics are usually similar to those reported by females who have the eating disorder (Muise, Stein, & Arbess, 2003; Olivardia & others, 1995).

Most anorexics are White adolescent or young adult females from well-educated, middle- and upper-income families that are competitive and high-achieving. Females who become anorexic often set high standards, become stressed about not being able to reach those standards, and are intensely concerned about how others perceive them (Striegel-Moore, Silberstein, & Rodin, 1993). Unable to meet their own high expectations, they turn to something they can control: their weight. The fashion slogan that "thin is beautiful" also contributes to the incidence of anorexia nervosa (Simpson, 2002).

About 70 percent of individuals with anorexia nervosa eventually recover. Recovery often takes 6 to 7 years, and relapses are common before a stable pattern of eating and weight maintenance is achieved (Kaye & others, 2000).

Bulimia Nervosa

Bulimia nervosa is an eating disorder in which the individual consistently follows a binge-and-purge eating pattern. The bulimic eats to excess and then purges by self-induced vomiting or using a laxative. As with anorexics, most bulimics are preoccupied with food, have a strong fear of becoming overweight, and

Might the current fashion image of "thin is beautiful" contribute to anorexia nervosa?

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

bulimia nervosa An eating disorder in which the individual consistently follows a binge-and-purge eating pattern.

are depressed or anxious (Byrne & Mclean, 2002; Cooley & Toray, 2001). But unlike anorexia nervosa, bulimia nervosa occurs within a normal weight range, which means that it is often difficult to detect (Mizes & Miller, 2000; Speranta & others, 2003).

Bulimia nervosa typically begins in late adolescence or early adulthood (Levine, 2002). About 90 percent of bulimics are females. Approximately 1 to 2 percent of females are estimated to develop bulimia nervosa (Gotesdam & Agras, 1995). Many were somewhat overweight before the onset of the disorder, and the binge eating often begins during an episode of dieting. As with anorexia nervosa, about 70 percent of individuals with bulimia nervosa eventually recover from it (Keel & others, 1999). You can follow the case of Nancy, who had a long struggle with this disorder, in the video clip "Bulimia Nervosa."

Chapter 13 further explores eating patterns and proper nutrition.

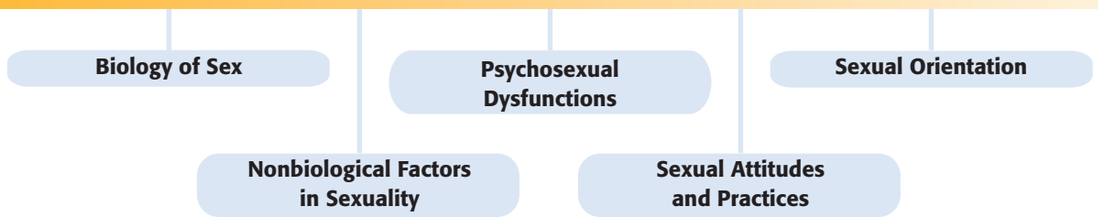
Review and Sharpen Your Thinking

2 ***Explain what motivates people to eat and to eat too much or too little.***

- Discuss the biology of hunger.
- Describe the biological, cognitive, and sociocultural factors involved in overeating and obesity.
- Evaluate the benefits and risks of dieting.
- Distinguish between anorexia nervosa and bulimia nervosa.

The "freshman 15" refers to the approximately 15 pounds that many students gain in their first year of college. What factors might explain this weight increase?

3 SEXUALITY



What factors motivate our sexual behavior?

We do not need sex for everyday survival, the way we need food and water, but we do need it for the survival of the species. Like hunger, sex has a strong physiological basis, as well as cognitive and sociocultural components.

Biology of Sex

What brain areas are involved in sex? What role do hormones play in sexual motivation? What is the nature of the human sexual response?

Sex and the Brain Motivation for sexual behavior is centered in the hypothalamus (Carter, 1998). However, like many other areas of motivation, brain functioning related to sex radiates outward to connect with a wide range of other brain areas in both the limbic system and the cerebral cortex.

The importance of the hypothalamus in sexual activity has been shown by electrically stimulating or surgically removing it. Electrical stimulation of certain hypothalamic areas increases sexual behavior; surgical removal of some hypothalamic areas

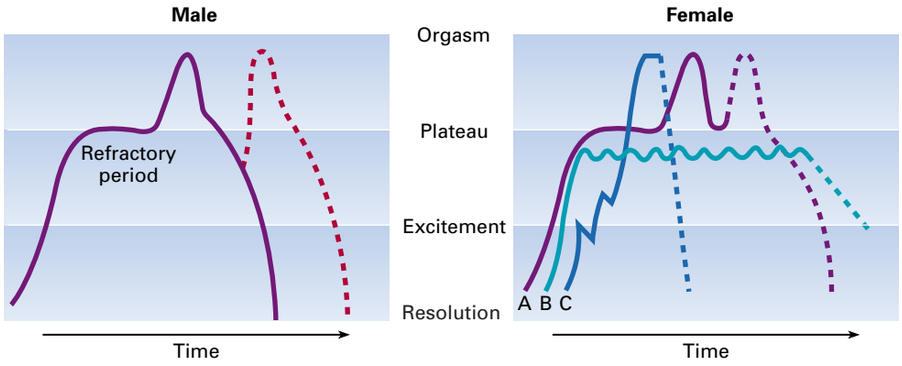


FIGURE 9.7 Male and Female Sexual Response Patterns Identified by Masters and Johnson *(Left)* Notice that males enter a refractory period, which lasts from several minutes up to a day, in which they cannot have another orgasm. *(Right)* Notice that female sexual responses follow one of three basic patterns: Pattern A somewhat resembles the male pattern, except it includes the possibility of multiple orgasms (the second peak) without falling below the plateau level. Pattern B represents nonorgasmic arousal. Pattern C represents intense female orgasm, which resembles the male pattern in its intensity and rapid resolution.

produces sexual inhibition. Electrical stimulation of the hypothalamus in a male can lead to as many as 20 ejaculations in 1 hour. The limbic system, which runs through the hypothalamus, also seems to be involved in sexual behavior. Its electrical stimulation can produce penile erection in males and orgasm in females.

In humans, the temporal lobes of the neocortex play an important role in moderating sexual arousal and directing it to an appropriate goal (Cheasty, Condren, & Cooney, 2002). And in male cats, temporal lobe damage has been shown to impair the ability to select an appropriate partner. Male cats with temporal lobe damage try to copulate with everything in sight: teddy bears, chairs, even researchers. Temporal lobe damage in humans also has been associated with changes in sexual activity (Trimble & Mendez, 1997).

The brain tissues that produce sexual feelings and behaviors are activated by various neurotransmitters in conjunction with various sex hormones. The intense reward of orgasm is caused by a massive rush of dopamine, and the deep feeling of relaxation that follows is linked with a hormone called oxytocin.

Sex Hormones Sex hormones are powerful chemicals that are controlled by the master gland in the brain, the pituitary gland. The two main classes of sex hormones are estrogens and androgens. **Estrogens,** the class of sex hormones that predominates in females, are produced mainly by the ovaries. **Androgens,** the class of sex hormones that predominates in males, are produced by the testes in males and by the adrenal glands in both males and females. Testosterone is an androgen. Estrogens and androgens can influence sexual motivation in both sexes.

The secretion of sex hormones is regulated by a feedback system. The pituitary gland monitors hormone levels and signals the testes or ovaries to manufacture sex hormones. Then the pituitary gland, through interaction with the hypothalamus, detects the point at which an optimal hormone level is reached and maintains this level.

The role of hormones in motivating human sexual behavior, especially for females, is not clear (Crooks & Bauer, 2002). For human males, higher androgen levels are associated with sexual motivation and orgasm frequency (Booth, Johnson, & Granger, 1999; Thijssen, 2002). Nonetheless, sexual behavior is so individualized in humans that it is difficult to specify the effects of hormones (Susman & Rogol, 2004).

Human Sexual Response Pattern What physiological changes do humans experience during sexual activity? To answer this question, gynecologist William Masters and his colleague Virginia Johnson (1966) carefully observed and measured the physiological responses of 382 female and 312 male volunteers as they masturbated or had sexual intercourse. The **human sexual response pattern** consists of four phases identified by Masters and Johnson (see figure 9.7).

1. *Excitement phase:* Lasts from several minutes to several hours, depending on the nature of the sex play involved. Engorgement of blood vessels and increased blood flow in genital areas and muscle tension characterize the excitement

estrogens The class of sex hormones that predominates in females.

androgens The class of sex hormones that predominates in males.

human sexual response pattern A sequence identified by Masters and Johnson; consists of four phases—excitement, plateau, orgasm, and resolution

phase. The most obvious signs of response in this phase are lubrication of the vagina and partial erection of the penis.

2. *Plateau phase:* Continuation and heightening of the arousal begun in the excitement phase. The increases in breathing, pulse rate, and blood pressure that occurred during the excitement phase become more intense, penile erection and vaginal lubrication are more complete, and orgasm is closer.
3. *Orgasm:* Lasts for only about 3 to 15 seconds. Orgasm involves an explosive discharge of neuromuscular tension and an intensely pleasurable feeling. However, orgasms are not all exactly alike. For example, females show three different patterns in the orgasm phase, as shown in figure 9.7: (A) multiple orgasms, (B) no orgasm, and (C) excitement rapidly leading to orgasm, bypassing the plateau phase. The third pattern most clearly corresponds to the male pattern in intensity and resolution.
4. *Resolution phase:* Return of blood vessels to their normal state. One difference between males and females in this phase is that females may be stimulated to orgasm again without delay. Males enter a *refractory period,* lasting from several minutes to an entire day, in which they cannot have another orgasm. The length of the refractory period increases as men age.

Nonbiological Factors in Sexuality

From experience, we know that biology alone does not control human sexuality (Crooks & Bauer, 2002). Cognitive, sensory/perceptual, and cultural factors all play an important role.

Cognition and Sex Consider the role of the mind. We might be sexually attracted to someone but understand that it is important to inhibit our sexual urges until the relationship has time to develop and we get to know the person better. We have the cognitive capacity to think about the importance of not raping or inflicting sexual harm on others. We also have the cognitive capacity to generate sexual images. For example, some individuals become sexually aroused by fantasy images of sex (Whipple, Ogden, & Komisaruk, 1992).

Sexual motivation is influenced by **sexual scripts**, stereotyped patterns of expectancies for how people should behave sexually. (Recall from the discussion of memory in chapter 7 that scripts are schemas for events.) Two sexual scripts are well known. In the *traditional religious script,* sex is accepted only within marriage. Extramarital sex is taboo, especially for women. Sex means reproduction and sometimes affection. In the *romantic script,* sex is equated with love. In this script, if we develop a relationship with someone and fall in love, it is acceptable to have sex with the person whether we are married or not. Typically, men and women have different sexual scripts. Females tend to link sexual intercourse with love more than males do, and males tend to emphasize sexual conquest. Some sexual scripts involve a double standard: For example, it is okay for male adolescents to have sex but not for females; women are generally expected to be responsible for contraception and are held solely to blame if they become pregnant.

Cognitive interpretation of sexual activity also involves our perception of the individual with whom we are having sex and his or her perception of us. We imbue our sexual acts with such perceptual questions as "Is he loyal to me?" "What is our future relationship going to be like?" "How important is sex to her?" "What if she gets pregnant?" Amid the wash of hormones in sexual activity is the cognitive ability to control, reason about, and try to make sense of the activity.

sexual scripts Stereotyped patterns of expectancies for how people should behave sexually.

Sensation, Perception, and Sex Along with cognitive factors, sensory/perceptual factors are involved in sexual behavior. The sensory system of touch usually predominates during sexual intimacy, but vision also plays an important role for some individuals (Brown, Steele, & Walsh-Childers, 2002). In general, women are more aroused by touch, men by what they see. This might explain why erotic magazines and movies are directed more toward males than toward females (Money, 1986).

Sexual behavior has its magnificent moments throughout the animal kingdom. Insects mate in midair, peacocks display their plumage, and male elephant seals have prolific sex lives. Experience plays a more important role in human sexual behavior. We can talk about sex with each other, read about it in magazines, and watch it on television and the movie screen. *Which nonbiological factors make human sexual behavior different from that of other animals?*

Might smell also be involved in sexual interest between women and men? **Pheromones** are scented substances that are powerful attractants in some animals (Beckman, 2002; Savic, 2002). Pheromones in the urine of ovulating female guinea pigs attract male guinea pigs. All the male cats in a neighborhood know that a female cat is in heat when they pick up the scent of pheromones. Several years ago, Jovan developed a fragrance the company claimed would attract men to women who wore it. The company advertised that the perfume contained a pheromone derived from human sweat. The fragrance was not the smashing success the perfumery anticipated, indicating that there is far more to sexual attraction in humans than smell.

Various foods and other substances also have been proposed as dramatically increasing sexual arousal. *Aphrodisiacs* are substances that supposedly arouse a person's sexual desire and increase his or her capacity for sexual activity. Recall from chapter 1 that I urged you to be skeptical about claims that eating ground-up tiger's penis will increase the male's sexual potency. Some foods, such as oysters, bananas, celery, tomatoes, and potatoes, are also touted as aphrodisiacs. Be wary of such claims. These foods do not influence sexual behavior. A substance referred to as "Spanish fly" also has been promoted as a powerful aphrodisiac. Not only is Spanish fly not an effective sexual stimulant, but it can cause genital inflammation, tissue damage, and even death.

pheromones Odorous substances released by animals that is a powerful sexual attractant.

Culture and Sex The range of sexual values across cultures is substantial (Tolman & Diamond, 2003). Some cultures consider sexual pleasures to be "normal" or "desirable";

other cultures view sexual pleasures as "weird" or "abnormal." We would consider the people who live on the small island of Ines Beag off the coast of Ireland to be among the most sexually repressed people in the world. They know nothing about tongue kissing or hand stimulation of the penis, and they detest nudity. For both females and males, premarital sex is out of the question. Men avoid most sexual experiences because they believe that sexual intercourse reduces their energy level and is bad for their health. Under these repressive conditions, sexual intercourse occurs only at night and takes place as quickly as possible as the husband opens his nightclothes under the covers and the wife raises her nightgown. As you might suspect, female orgasm is rare in this culture (Messinger, 1971).

In contrast, the Mangaian culture in the South Pacific seems promiscuous to us. In Mangaia, young boys are taught about masturbation and are encouraged to engage in it as much as they like. At age 13, the boys undergo a ritual that initiates them into sexual manhood. First, their elders instruct them about sexual strategies, including how to aid their female partner in having orgasms. Then, 2 weeks later, each boy has intercourse with an experienced woman who helps him hold back ejaculation until she can achieve orgasm with him. By the end of adolescence, Mangaians have sex pretty much every day. Mangaian women report a high frequency of orgasm.

Psychosexual Dysfunctions

Myths would have us believe that many women are uninterested in sexual pleasure and that most men can hardly get enough. Although men do think about sex more than women do, most men and women have desires for sexual pleasure, and both sexes can experience psychological problems that interfere with the attainment of sexual pleasure. (The video clip "Transvestic Fetishism" presents the example of men for whom cross-dressing is essential to sexual gratification.) **Psychosexual dysfunctions** are disorders that involve impairments in the sexual response pattern, either in the desire for gratification or in the ability to achieve it.

In disorders associated with desire, both men and women show little or no sexual drive or interest. In disorders associated with the excitement phase, men may not be able to maintain an erection (Becker & others, 2002; McKinlay, 1999). In disorders associated with the orgasmic phase, both women and men reach orgasm either too quickly or not at all. Premature ejaculation in men occurs when the time between the beginning of sexual stimulation and ejaculation is unsatisfactorily brief. Many women do not routinely experience orgasm in sexual intercourse. Inhibited male orgasm does occur, but it is much less common than inhibited female orgasm.

The treatment of psychosexual dysfunctions has undergone a revolution in recent years. Once thought of as extremely difficult therapeutic challenges, most cases of psychosexual dysfunction now yield to techniques tailored to improve sexual functioning (Bhugra & de Silva, 1998; Crooks & Bauer, 2002). New treatments that focus directly on each sexual dysfunction have reached success rates of 90 percent or more (McConaghy, 1993). For example, the success rate of a treatment that encourages women to enjoy their bodies and engage in self-stimulation to orgasm, with a vibrator if necessary, approaches 100 percent (Anderson, 1983). Some of these women subsequently transfer their newly developed sexual responsiveness to interactions with partners.

Recently, attention has focused on Viagra, a drug designed to conquer impotence (Nehra & others, 2002; Seidman, 2002). Its success rate is in the range of 60 to 80 percent, and its prescription rate has outpaced such popular drugs as Prozac (antidepressant) and Rogaine (baldness remedy) in first-year comparisons (Padma-Nathan, 1999). However, Viagra is not an aphrodisiac; it won't work in the absence of desire. The downside of Viagra is headaches in 10 percent of men; temporary vision problems, ranging from blurred vision to a blue or green halo effect in about 3 percent of men; and blackouts due to a sudden drop in blood pressure (Steers & others, 2001). Also, scientists do not yet know the long-term effects of taking the drug, although in short-term trials it appears to be relatively safe.

psychosexual dysfunctions Disorders that involve impairments in the sexual response pattern, either in the desire for gratification or the ability to achieve it.

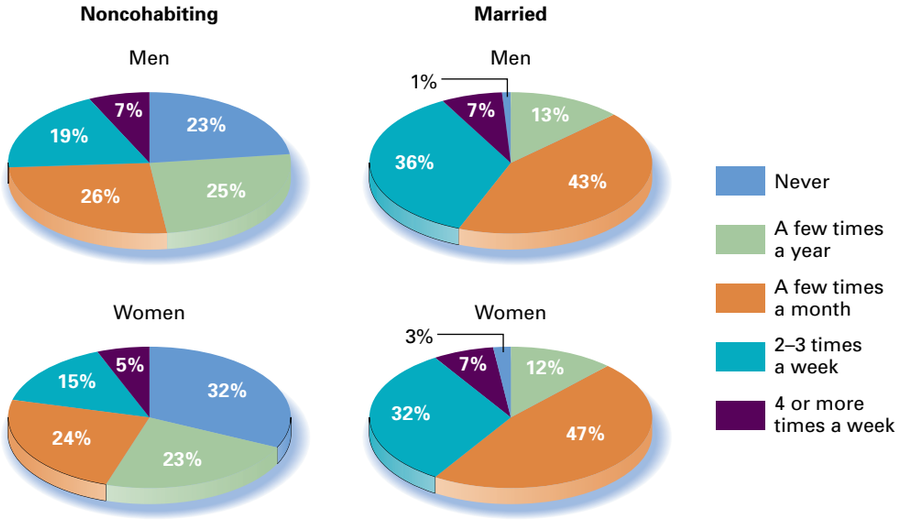


FIGURE 9.8 1994 *Sex in America* Survey Percentages show noncohabiting and married males' and females' responses to the question "How often have you had sex in the past year?"

Sexual Attitudes and Practices

In the United States today, sexual behaviors and attitudes reflect a diverse, multicultural population, placing Americans somewhere in the middle of a continuum from repressive to liberal. But describing sexual practices in America has always been challenging (Dunne, 2002; Wiederman & Whitley, 2002).

In 1948, Alfred Kinsey and his colleagues shocked the nation with their report of a survey of Americans' sexual practices. It revealed that, among other observations, half of American men had engaged in extramarital affairs. However, Kinsey's results were not representative, because he recruited volunteers wherever he could find them, including hitchhikers who passed through town, fraternity men, and even mental patients. Despite the study's flaws, the Kinsey data were widely circulated, and many people felt that they must be leading more conservative sexual lives than others.

Subsequent large-scale magazine surveys confirmed a trend toward permissive sexuality (Hunt, 1974). In these surveys, Americans were portrayed as engaging in virtually unending copulation. However, most magazine polls are skewed because of the background of the readers who complete the surveys. For example, surveys in *Playboy* and *Cosmopolitan* might appeal to subscribers who want to use the survey to brag about their sexual exploits.

Not until 1994 were more accurate data obtained from a well-designed, comprehensive study of American's sexual patterns. Robert Michael and his colleagues (1994) interviewed nearly 3,500 people from 18 to 50 years of age who were randomly selected, a sharp contrast from earlier samples. Following are some of the key findings from that survey:

- Americans tend to fall into three categories: One-third have sex twice a week or more, one-third a few times a month, and one-third a few times a year or not at all.
- Married couples have sex most often and are the most likely to have orgasms when they do. Figure 9.8 portrays the frequency of sex for married and noncohabiting individuals in the year before the survey was taken.
- Most Americans do not engage in kinky sexual acts. When asked about their favorite sexual acts, the vast majority (96 percent) said that vaginal sex was "very" or "somewhat" appealing. Oral sex was in third place, after an activity that many might not even label a sexual act—watching a partner undress.

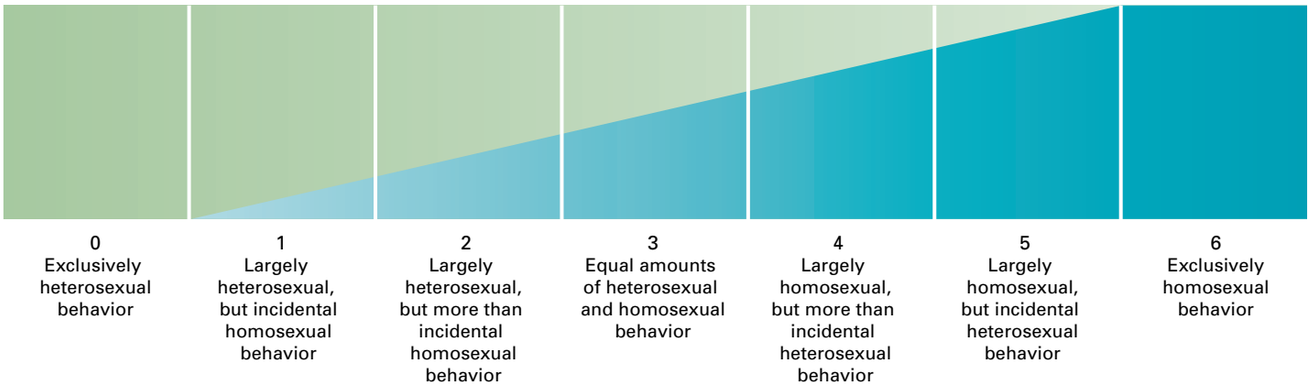


FIGURE 9.9 Continuum of Sexual Orientation The continuum ranges from exclusive heterosexuality, which Kinsey and associates (Kinsey, Pomeroy, & Martin, 1948) labeled 0, to exclusive homosexuality, labeled 6. People who are about equally attracted to both sexes, 2 to 4, are bisexual.

- Adultery is clearly the exception rather than the rule. Nearly 75 percent of the married men and 85 percent of the married women indicated that they have never been unfaithful.
- Men think about sex far more often than women do—54 percent of the men said they think about it every day or several times a day, whereas 67 percent of the women said they think about it only a few times a week or a few times a month.

One of the most powerful messages in the 1994 survey was that Americans' sexual lives are more conservative than previously believed. Although 17 percent of the men and 3 percent of the women said they have had sex with at least 21 partners, the overall impression from the survey was that sexual behavior is ruled by marriage and monogamy for most Americans.

We just mentioned that men think about sex more often than women do. Another gender difference is that women link sexual intercourse with love more than men do. A recent review of research also concluded that (Baumeister, Catanese, & Vohs, 2001): Men report more frequent feelings of sexual arousal, have more frequent sexual fantasies, and rate the strength of their own sex drive higher than women. Men also are more likely to masturbate, have more permissive attitudes about casual premarital sex, and have a more difficult time adhering to their vows of celibacy when they become married (Oliver & Hyde, 1993; Peplau, 2002, 2003).

According to sexuality expert Bernie Zilbergeld (1992), dramatic changes in the sexual landscape have taken place in the past several decades—from changing expectations of women to new definitions of masculinity, from the fear of disease to the renewed focus on long-term relationships. Sexuality's many myths have led to unrealistic expectations for our sexual lives. Among sexual myths, according to Zilbergeld (1992), are that men need a large penis to satisfy a woman; that male and female orgasm are absolutely necessary for sexual satisfaction; that intercourse is the only real sexual act; that good sex has to be spontaneous (without planning or talking); and that for men to have questions, doubts, or problems in sex is practically a crime.

Too often, people think of sex as a performance skill, like race car driving or swimming. However, sex is best conceptualized as a form of communication within a relationship (Hendrick, 2004). Indeed, caring couples with good communication skills can usually survive most sexual problems, whereas uncaring couples with poor communication skills often do not have lasting relationships even if their sexual experiences are adequate or even good.

Although the majority of us develop a mature sexuality, most experience some periods of vulnerability and confusion. (The video clip "Changing Genders" presents the example of Angela, who has chosen to undergo sex reassignment surgery.) Some

worry about their sexual attractiveness, their ability to satisfy their sexual partner, and whether they will experience their ultimate sexual fantasy. Often our worries are fueled by media images of sexual potency and sexual exploits.

Sexual Orientation

Although Americans are more conservative in sexual habits than once thought, we are somewhat more open-minded regarding sexual orientation than a century ago. Until the end of the nineteenth century, it was generally believed that people were either heterosexual or homosexual. Today, it is more accepted to view sexual orientation along a continuum (Kelly, 2004). Kinsey & others, (1948) described this continuum on a scale ranging from 0 (exclusive heterosexuality) to 6 (exclusive homosexuality) (see figure 9.9). Also, some individuals are *bisexual,* being sexually attracted to people of both sexes.

What determines sexual orientation?

In Kinsey's research, approximately 1 percent of individuals reported being bisexual (1.2 percent of males and 0.7 percent of females), and about 2 to 5 percent of individuals reported being homosexual (4.7 percent of males and 1.8 percent of females). In the 1994 *Sex in America* survey, only 2.7 percent of the men and 1.3 percent of the women reported that they had had homosexual sex in the past year (Michael & others, 1994).

Why are some individuals homosexual and others heterosexual? Speculation about this question has been extensive, but no firm answers are available. Homosexuals and heterosexuals have similar physiological responses during sexual arousal and seem to be aroused by the same types of touching. Investigators find no differences between homosexuals and heterosexuals in a wide range of attitudes, behaviors, and adjustments (Bell, Weinberg, & Mammersmith, 1981; Savin-Williams & Diamond, 2004). Homosexuality once was classified as a mental disorder, but both the American Psychiatric Association and the American Psychological Association discontinued this classification in the 1970s.

More recently, researchers have explored the possible biological basis of homosexuality (Gladue, 1994). The results of hormone studies have been inconsistent. If male homosexuals are given male sex hormones (androgens), their sexual orientation doesn't change; their sexual desire merely increases. But a very early prenatal critical period might influence sexual orientation. In the second to fifth months after conception, exposure of the fetus to hormone levels characteristic of females might cause the individual (whether male or female) to become attracted to males (Ellis & Ames, 1987). If this critical period hypothesis turns out to be correct, it would explain why clinicians have found that sexual orientation is difficult, if not impossible, to modify.

With regard to anatomical structures, neuroscientist Simon LeVay (1991) found that an area of the hypothalamus that governs sexual behavior is twice as large (about the size of a grain of sand) in heterosexual males as in homosexual males. This area was found to be about the same size in homosexual males and heterosexual females. Critics of this research point out that many of the homosexuals in the study had AIDS and suggest that their brains could have been altered by the disease.

An individual's sexual orientation—homosexual, heterosexual, or bisexual—is most likely determined by a combination of genetic, hormonal, cognitive, and environmental factors (Baldwin & Baldwin, 1998; Garnets, 2002). Most experts on homosexuality believe that no one factor alone causes homosexuality and that the relative weight of each factor can vary from one individual to the next. In effect, no one knows exactly why some individuals are homosexual.

Scientists have a clearer picture of what does not cause homosexuality. For example, children raised by gay or lesbian parents or couples are no more likely to be homosexual than children raised by heterosexual parents (Patterson, 2000, 2002). There also is no evidence that male homosexuality is caused by a dominant mother or a weak father or that female homosexuality is caused by girls choosing male role models.

Many gender differences that appear in heterosexual relationships also occur in homosexual relationships. Like heterosexual women (Peplau, 2002, 2003; Peplau, Fingerhut, & Beals, 2004),

- Lesbians' sexual fantasies are more likely than gay men's to be personal and romantic.
- Lesbians have fewer sex partners than gay men.
- Lesbians have less permissive attitudes about casual sex and sex outside a primary relationship than gay men.

How can gays and lesbians adapt to a world in which they are a minority? According to psychologist Laura Brown (1989), gays and lesbians experience life as a minority in a dominant majority culture. Brown believes that gays and lesbians adapt best when they don't define themselves in polarities, such as trying to live in a separate gay or lesbian world or completely accepting the majority culture. Instead, developing a bicultural identity and balancing the demands of the two cultures can often lead to more effective coping for homosexuals, says Brown.

Review and Sharpen Your Thinking

3 ***Discuss the motivation for sex.***

- Describe the biology of sex.
- Identify cognitive, sensory/perceptual, and cultural factors that affect sexual behavior.
- Explain the nature and treatment of psychosexual dysfunctions.
- Characterize sexual behavior in the United States.
- Summarize the factors that determine sexual orientation.

A substance called "Spanish fly" has been promoted as a powerful aphrodisiac. As mentioned, it is not an effective sexual stimulant and can be dangerous. What might explain people's faith in this and other so-called aphrodisiacs?

4 NEED FOR ACHIEVEMENT

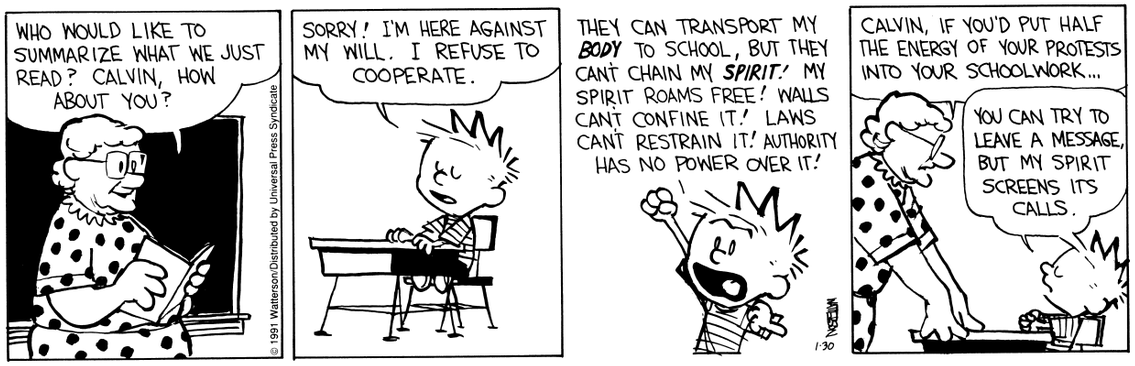
Cognitive Factors in Achievement

Sociocultural Factors in Achievement

What motivates people to achieve?

The previous discussions of hunger and sexual motivation focused to a large degree on physiological factors. Although there is a significant cognitive component to eating and sexual behavior, it does not always predominate. This section presents a motive

Calvin and Hobbes by Bill Watterson



that has strong social cognitive foundations: the need for achievement. **Need for achievement** is the desire to accomplish something, to reach a standard of excellence, and to expend effort to excel. Some people are highly motivated to succeed and spend considerable effort striving to excel, like cyclist Lance Armstrong. But individuals differ in their achievement motivation. Others are not as motivated to succeed and don't work as hard to achieve. To explore your level of need for achievement, play a ring toss game in the interactivity "Need for Achievement."

Psychologist David McClelland (1955) assessed need for achievement by showing individuals ambiguous pictures. The individuals were asked to tell a story about the pictures, and their comments were scored according to how strongly they reflected achievement. Researchers also revealed that individuals whose stories reflected high achievement motivation had a stronger hope for success than fear of failure, were moderate rather than high or low risk takers, and persisted with effort when tasks became difficult (Atkinson & Raynor, 1974).

McClelland (1978) also wondered if increasing achievement motivation would actually encourage people to strive harder for success. To find out, he trained the businessmen in a village in India to be more achievement-oriented, encouraging them to increase their hope for success, reduce their fear of failure, take moderate risks, and try harder in the face of difficulty. Compared with businessmen in a nearby village, the men that McClelland trained started more new businesses and employed more new people in the 2 years after the training.

Cognitive Factors in Achievement

Earlier in this chapter, I highlighted two key cognitive factors in motivation: intrinsic motivation, which is based on such internal factors as self-determination, curiosity, challenge, and effort, and extrinsic motivation, which involves external incentives, such as rewards and punishments. Intrinsic and extrinsic factors often work together to motivate achievement, as work on attribution shows. To think further about intrinsic and extrinsic motivation, see the Critical Controversy box.

need for achievement The desire to accomplish something, to reach a standard of excellence, and to expend effort to excel.

attribution theory The idea that individuals are motivated to discover the underlying causes of behavior as part of their effort to make sense of it.

Attribution

Attribution theory states that individuals are motivated to discover the causes of behavior in an effort to make sense of it. Like intuitive scientists, people seek the cause behind what happens. (Attribution is also discussed in chapter 14.)

The reasons individuals behave the way they do can be classified in a number of ways, but one basic distinction stands out above all others—the distinction between internal causes—such as personality traits or motives—and external causes—environmental, situational factors, such as rewards or task difficulty (Heider, 1958). If

Critical Controversy

Does Extrinsic Motivation Undermine Intrinsic Motivation?

The distinction between intrinsic and extrinsic motivation is well established in psychology (Alderman, 2004). The basic idea is that we can be motivated by internal (intrinsic) factors, such as self-generated goals, or external (extrinsic) factors, such as praise or a monetary reward. It is commonly argued that intrinsic motivation is preferable to extrinsic motivation because it leads to more positive outcomes (Deci, Koestner, & Ryan, 2001). Also extrinsic motivation is thought to reduce intrinsic motivation (Lepper, Greene, & Nisbett, 1973). A wide variety of social (extrinsic) events, such as deadlines, surveillance, and coercive rewards, can reduce the enjoyment (intrinsic motivation) associated with work, play, and study. These ideas have exerted a board influence in educational and occupational settings, where teachers and employers seek to increase the intrinsic motivation of their students and employees, respectively (Stipek, 2001; Wigfield & Eccles, 2002).

Recently, however, two reviews of studies on intrinsic and extrinsic motivation (Cameron, 2001; Deci, Koestner, & Ryan, 2001) reached opposite conclusions. Edward Deci and his colleagues (2001) analyzed more than 100 studies and concluded that the main negative effect of external rewards was to restrict self-determination and interfere with intrinsic motivation. In contrast, an analysis of more than 100 studies by Judy Cameron (2001) yielded mixed results. Cameron found that extrinsic rewards sometimes produced the expected negative effects on intrinsic motivation but that sometimes they had a positive effect or no effect at all. The true state of affairs, they suggest, is that extrinsic motivation has no overall effect on intrinsic motivation.

For example, some psychologists argue that tangible reinforces, such as money or prizes, often undermine intrinsic motivation, whereas verbal reinforcers, such as praise, can actually enhance intrinsic motivation (Lepper, Greene, & Nisbett, 2001). Thus paying a beginning reader money to read books may undermine that child's interest in reading, but praising that child for good reading may increase the child's interest. Similarly, Cameron (2001) believes that extrinsic motivation undermines intrinsic motivation when intrinsic motivation is high but can be very helpful when intrinsic motivation is low. Thus many beginning readers are motivated to read and may actually lose interest if they are reinforced for reading. In contrast, children who are not internally motiviated to read may benefit from reinforcement and encouragement until their intrinsic motivation increases.

The problem, according to Cameron (2001), lies in the rigid acceptance of general statements about motivation, such as "extrinsic motivation reduces internal motovation." In the case of beginning readers, using this statement as a guiding principle may not damage the intrinsic motivation of motivated readers, but it may also leave poorly motivated beginning readers with little reason to practice their reading. Cameron argues that people often do things that are not intrinsicially motivating (such as mowing the lawn or studying mathematics) and that, without external rewards, we may simply lose interest in doing them. In such cases, extrinsic motivation may help foster intrinsic motivation in an activity. For example, a creative mathematics teacher might use rewards, such as extra credit, math games, and verbal praise, as a way to instill a life-long love of mathematics.

Cameron (2001) suggests that we need a better understanding of extrinsic rewards and intrinsic motivation, to distinguish between the effects of verbal and material reinforcement, for example, and between weak and strong intrinsic motivation. A richer understanding of intrinsic and extrinsic motivation might make it possible to better predict when extrinsic motivation will reduce, increase, or not affect intrinsic motivation. We might then be able to help more employees and students develop the deep intrinsic motivation that most of us agree is indispensable to well-being.

What do you think?

- Can you think of examples from your own life where your intrinsic motivation was reduced by external rewards? Increased by external rewards?
- What are some other factors that might determine whether extrinsic motivation influences intrinsic motivation?
- If you were a classroom teacher and a child in your class was not motivated to learn, how would you use intrinsic and/or extrinsic motivation to help the child become more motivated to learn?

college students do not do well on a test, do they attribute their low score to the teacher's plotting against them and making the test too difficult (external cause) or to not studying hard enough (internal cause)? The answer to such a question influences how people feel about themselves. If students believe that their performance is the teacher's fault, they will not feel as bad when they do poorly as they will if they believe they did not spend enough time studying.

An extremely important aspect of internal cause for achievement is *effort.* Unlike many causes of success, effort is under a person's control and can be changed. The importance of effort in achievement is recognized even by children. In one study, third- to sixth-grade students felt that effort was the most effective strategy for good school performance (Skinner, Wellborn, & Connell, 1990).

Self-Generated Goals One cognitive factor that helps individuals to reach their dreams, increase their self-discipline, and maintain interest is a set of goals that they determine on their own. Goal setting, planning, and self-monitoring are critical aspects of achievement (Brophy, 2004; Pintrich & Schunk, 2002) and often work in concert.

Researchers have found that individuals' achievement improves when they set goals with three qualities (Bandura, 1997; Schunk, 2000, 2004):

- *Specific.* A nonspecific goal is "I want to be successful." A concrete, specific goal is "I want to have a 3.5 average at the end of the semester."
- *Short-term.* It is okay to set long-term goals, such as "I want to be a clinical psychologist," but, if you do, make sure that you also create short-term goals as steps along the way. "I want to get an *A* on the next psychology test" or "I will do all of my studying for this class by 4 P.M. Sunday" is an example of a short-term goal.
- *Challenging.* Strong interest and eager involvement are sparked by challenges. Goals that are too easy to reach generate little interest or effort. However, unrealistically high goals can bring failure and diminish self-confidence.

Planning how to reach a goal and monitoring progress toward the goal are critical aspects of achievement (Eccles, Wigfield, & Schiefele, 1998). High-achieving individuals monitor their learning and systematically evaluate progress toward their goals more than low-achieving individuals do (Zimmerman, 2001; Zimmerman & Schunk, 2001, 2004). To evaluate how goal-directed you are, see the Psychology and Life box.

How Goal-Directed Are You?

Psychology and Life

To evaluate how goal-directed you are, consider how much each of the following statements is like you or not like you.

1. I set long-term and short-term goals.
2. I set challenging goals that are neither too easy nor beyond my reach.
3. I am good at managing my time and setting priorities to make sure I get the most important things done.
4. I regularly make "to-do" lists and successfully get most items done.
5. I set deadlines and consistently meet them.
6. I regularly monitor how well I'm progressing toward my goals and make changes in my behavior if necessary.
7. When I am under pressure, I still plan my days and weeks in a clear, logical manner.

If most of these statements characterize you, then you likely are a goal-directed individual. If these statements do not characterize you, then consider ways that you can become more goal-directed.

Sociocultural Factors in Achievement

Our sociocultural contexts also contribute to our motivation to achieve (Eccles, 2004; Wigfield & Eccles, 2002). This section on sociocultural factors focuses on comparisons across cultures and ethnicities. (The video clip "Culture and Self" also explores differences in motivation for achievement across cultures.)

Cross-Cultural Comparisons One study of 104 societies revealed that, in general, parents in nonindustrialized countries placed a lower value on their children's achievement and independence and a higher value on obedience and cooperation than did parents in industrialized countries (Barry, Child, & Bacon, 1959). People in the United States are more achievement-oriented than people in many other countries. However, some cultures appear to value achievement, especially in school,

Asian students score considerably higher than U.S. students on math achievement tests. *What are some possible explanations for this?*

more than Americans do. In one study, American eighth-grade students fell in the average range in math and science tests comparing students from 45 countries (Atkin & Black, 1997). Students from Korea, Singapore, and Japan scored the highest.

Harold Stevenson and his colleagues (Stevenson, 1995, 2000; Stevenson & Hofer, 1999; Stevenson, Lee, & Stigler, 1986; Stevenson & others, 1990) have completed five cross-cultural studies of students in the United States, China, Taiwan, and Japan. In these studies, Asian students consistently outperform American students. And the longer they are in school, the wider the gap between Asian and American students becomes—the lowest difference is in the first grade, the highest in eleventh grade (the highest grade studied). To learn more about the reasons for these large cross-cultural differences, Stevenson and his colleagues spent thousands of hours observing in classrooms, as well as interviewing and surveying teachers, students, and parents. They found that Asian teachers spent more time teaching math than American teachers did: For example, more than one-fourth of total classroom time in the first grade was spent on math instruction in Japan, compared with only one-tenth of the time in U.S. first-grade classrooms. Also, Asian students were in school an average of 240 days a year, compared with 178 days in the United States.

Stevenson and his colleagues also found differences in Asian and American parents. American parents had much lower expectations for their children's education and achievement than Asian parents did. Also, American parents were likelier to believe that their children's math achievement is due to innate ability, whereas Asian parents were more likely to believe that their children's math achievement is the consequence of effort and training (see figure 9.10). Asian students were more likely than American students to do math homework, and Asian parents were far more likely to help their children with their math homework than American parents were (Chen & Stevenson, 1989).

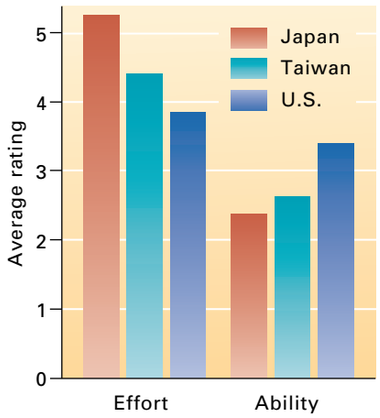


FIGURE 9.10 Mothers' Beliefs About the Factors Responsible for Children's Math Achievement in Three Countries In one study, mothers in Japan and Taiwan were more likely to believe that their children's math achievement was due to effort rather than to innate ability, whereas U.S. mothers were more likely to believe their children's math achievement was due to innate ability (Stevenson, Lee, & Stigler, 1986).

In another cross-cultural comparison of math education, researchers analyzed videotapes of eighth-grade teachers' instruction in the United States, Japan, and Germany (Stigler & Hiebert, 1997). Differences included these: (1) Japanese students spent less time solving routine math problems and more time inventing, analyzing, and proving than American or German students; (2) Japanese teachers engaged in more direct lecturing than American or German teachers; and (3) Japanese teachers were more likely to emphasize math thinking, whereas American and German teachers were more likely to stress math skills (solving a specific problem or using a specific formula). Also noticeable was the emphasis on collaborative planning with other teachers in Japanese math education.

An important conclusion from these cross-cultural studies is that learning and achievement take time and effort. The more time students spend learning, the more likely they are to learn the material and achieve high standards.

Ethnic Comparisons Until recently, researchers studying achievement focused almost exclusively on White males, and any studies of achievement in ethnic minorities measured them against standards of achievements for White males. As a result, many researchers unfortunately concluded that ethnic minorities were somehow deficient in achievement (Gibbs & Huang, 1989).

In addition, most studies on ethnic minorities have not taken into account socioeconomic status. *Socioeconomic status (SES)* is determined by a combination of occupation, education, and income. When both ethnicity and socioeconomic status are taken

into account in the same study, socioeconomic status tends to be a far better predictor of achievement than is ethnicity (Graham, 1986, 2001). For example, middle SES individuals, regardless of their ethnic background, have higher aspirations and expectations than low SES individuals do. Sandra Graham (1986) has found that middle SES African American children, like middle SES White children, have high expectations for their own achievement and understand that failure is often due to lack of effort rather than to bad luck.

Psychologist Sandra Graham, from University of California, Los Angeles, talking with young boys about motivation. Dr. Graham's research shows that both African American and White middle-class children have high achievement expectations and attribute failures to lack of effort, rather than to lack of luck.

Review and Sharpen Your Thinking

4 ***Explain why people are motivated to achieve.***

- Discuss the need for achievement and the factors that motivate people to excel.

Make a list of the factors that motivate you to achieve, whether at school, at work, in sports, or in some other endeavor. Which of these factors are intrinsic and which are extrinsic?

EMOTION 5

Biology of Emotion | Nonbiological Factors in Emotion | Classification of Emotions

What are the factors that influence emotion?

The terms *motivation* and *emotion* both come from the Latin word *movere,* which means "to move." Both motivation and emotion spur us into action. And just as there are different kinds and intensities of motivation, so it is with emotions. A person can be more motivated to eat than to have sex and at different times can be more or less hungry or more or less interested in having sex. Similarly, a person can be happy—ranging from pleased to ecstatic—or angry—ranging from annoyed to fuming.

Defining emotion is difficult because it is not always easy to tell when a person is in an emotional state. For our purposes, **emotion** is defined as feeling, or affect, that can involve physiological arousal (a fast heartbeat, for example), conscious experience (thinking about being in love with someone, for example), and behavioral expression (a smile or grimace, for example). Thus the body, the mind, and the face all play important roles in emotion, although psychologists debate which of these components is the most important aspect of emotion and how they mix to produce emotional experiences.

Biology of Emotion

As you drive down the highway, the fog thickens. Suddenly you see a pile of cars in front of you. Your mind temporarily freezes, your muscles tighten, your stomach becomes queasy, and your heart feels as if it is going to pound out of your chest. You immediately slam on the brakes and try to veer away from the pile of cars. Tires screech, windshield glass flies, and metal smashes. Then all is quiet. After a few short seconds, you realize that you are alive. You find that you can climb out of the car. Your fear turns to joy, as you sense your luck in not being hurt. In a couple of seconds, the joy turns to anger. You loudly ask, "Who caused this accident?" As your emotions change from fear to joy to anger, your body changes also.

emotion A feeling, or affect, that can involve physiological arousal, conscious experience, and behavioral expression.

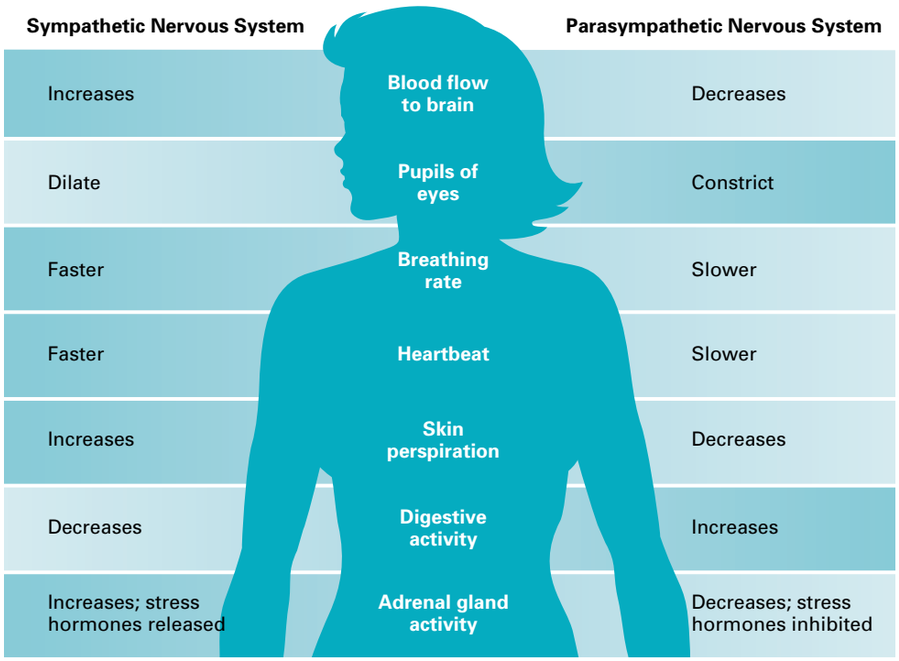


FIGURE 9.11 Autonomic Nervous System and Its Role in Arousing and Calming the Body

Examiners use a polygraph to determine if someone is lying. A polygraph monitors changes in the body believed to be influenced by emotional states. Controversy has swirled about the polygraph's use because it is unreliable. *What makes the polygraph unreliable?*

polygraph A machine that monitors changes in the body thought to be influenced by emotional states; it is used by examiners to try to determine if someone is lying.

Arousal Recall from chapter 2 that the *autonomic nervous system (ANS)* takes messages to and from the body's internal organs, monitoring such processes as breathing, heart rate, and digestion. The ANS is divided into the sympathetic and the parasympathetic nervous systems (see figure 9.11). The *sympathetic nervous system (SNS)* is involved in the body's arousal; it is responsible for a rapid reaction to a stressor, sometimes referred to as the fight-or-flight response. The SNS immediately causes an increase in blood pressure, a faster heart rate, more rapid breathing for greater oxygen intake, and more efficient blood flow to the brain and major muscle groups. All of these changes prepare us for action. At the same time, the body stops digesting food, which is not necessary for immediate action (this could explain why, just before an exam, students usually are not hungry). The *parasympathetic nervous system (PNS)* calms the body and promotes relaxation and healing. When the PNS is activated, heart rate and blood pressure drop, stomach activity and food digestion increase, and breathing slows.

The sympathetic and parasympathetic nervous systems evolved to improve the human species' likelihood for survival, but it does not take a life-threatening situation to activate them. Emotions, especially anger, are associated with elevated SNS activity, such as heightened blood pressure and heart rate. States of happiness and contentment also activate the SNS to a lesser extent.

Because arousal includes a physiological response, researchers have been intrigued by how to measure it accurately. One aspect of emotional arousal is *galvanic skin response (GSR),* an increase in the skin's electrical conductivity when sweat gland activity increases. Measurement of this electrical activity provides an index of arousal that has been used in a number of studies of emotion.

Another measure of arousal is the **polygraph,** a machine used by examiners to try to determine if someone is lying; it monitors changes in the body thought to be influenced by emotional states. In a typical polygraph test, an individual is asked a number of neutral questions and several key, less neutral questions. If the individual's heart rate, breathing, and skin resistance to passage of a weak electric current

increase substantially when the key questions are asked, the individual is assumed to be lying. (Lying has also been linked with certain facial expressions, as discussed in the video clip "Detecting Deception.")

Accurately identifying truth or deception is linked with the skill of the examiner and the skill of the individual being examined. Heart rate and breathing can increase for reasons other than lying, making it difficult to interpret these physiological indicators of arousal. Body movements and the presence of certain drugs in the person's system can interfere with the polygraph's accuracy. Experts believe that the polygraph errs just under 50 percent of the time and that it cannot distinguish between such feelings as anxiety and guilt (Iacono & Lykken, 1997). The Employee Polygraph Protection Act of 1988 restricts polygraph testing outside government agencies, and most courts do not accept the results of polygraph testing. Some psychologists defend the polygraph's use, saying that polygraph results are as sound as other, admissible forms of evidence, such as hair fiber analysis (Honts, 1998). The majority of psychologists, though, argue against the polygraph's use because of its basic inability to tell who is lying and who is not (Greenberg, 2002; Malakoff, 2003).

Psychologists are also interested in how arousal is interpreted as emotion. Imagine that you and your date are enjoying a picnic in the country. Suddenly, a bull runs across the field toward you. Why are you afraid? One well-known theory is that each emotion, from anger to rapture, arises from the perception of a distinct set of one's own physiological changes, evident in heart rate, breathing patterns, sweating, and other responses (James, 1890/1950; Lange, 1922). You see the bull scratching his hoof on the ground, and you begin to run away. Your aroused body then sends sensory messages to your brain, at which point emotion is perceived. According to this theory, you do not run away because you are afraid; rather, you are afraid because you are running away.

Another well-known theory is much the same, but it argues that different emotions cannot be associated with specific physiological changes (Bard, 1934; Cannon, 1927). Autonomic nervous system responses are too diffuse and slow to account for rapid and differentiated emotional responses. Imagine the picnic and the bull once again. Seeing the bull scratching his hoof causes the thalamus of your brain to do two things simultaneously: stimulate your autonomic nervous system to produce the physiological changes involved in emotion (increased heart rate, rapid breathing) and send messages to your cerebral cortex, where the experience of emotion is perceived. In this theory, emotion and physiological reactions occur simultaneously, and the body plays a less important role.

The question of whether or not emotions involve discrete autonomic nervous system responses continues to be debated (Christie & Friedman, 2004; Keltner & Ekman, 2000). Recent studies have documented some emotion-specific autonomic nervous system responses, though (Lang, Davis, & Ohman, 2000). For example, fear, anger, and sadness are associated with increased heart rate, but disgust is not. Also, anger is linked with increased blood flow to the hands, an effect that is not triggered by fear.

Neural Circuits and Neurotransmitters Contemporary researchers are interested in charting the neural circuitry of emotions and discovering the role of neurotransmitters. The focus of much of their work has been the amygdala, an almond-shaped structure in the limbic system (discussed in chapter 2). The amygdala houses circuits that are activated when we experience negative emotions.

Joseph LeDoux (1996, 2000, 2001, 2002; LaBar & LeDoux, 2002) has conducted a number of studies that focus on the neural circuitry of one emotion: fear. When the amygdala determines that danger is present, it shifts into high gear, marshaling the resources of the brain in an effort to protect the organism. The amygdala receives neurons from all of the senses: sight, hearing, smell, touch. If a danger is communicated by any of these neurons, the amygdala immediately sends out messages to bodily organs. This fear system was designed by evolution to detect and respond to predators and other natural dangers that threatened survival or territory.

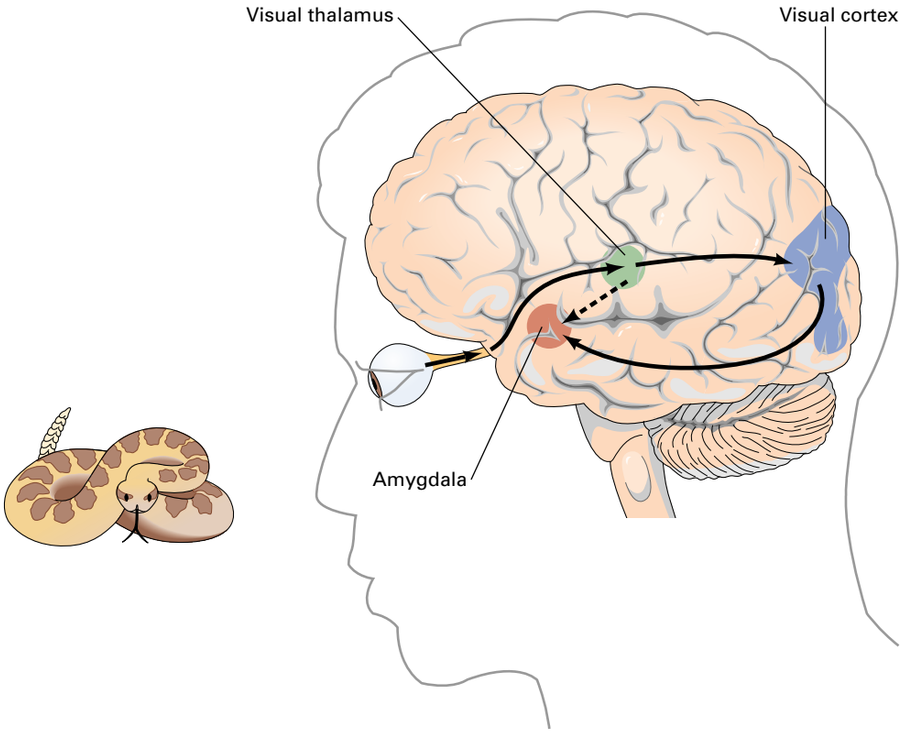


FIGURE 9.12 Direct and Indirect Brain Pathways in the Emotion of Fear Information about fear can follow two pathways in the brain. The direct pathway *(broken arrow)* conveys information rapidly from the thalamus to the amygdala. The indirect pathway *(solid arrows)* transmits information more slowly from the thalamus to the sensory cortex, then to the amygdala.

The brain circuitry that involves the emotion of fear can follow two pathways: a direct pathway from the thalamus to the amygdala or an indirect pathway from the thalamus through the sensory cortex to the amygdala (see figure 9.12). The direct pathway does not convey detailed information about the stimulus, but it has the advantage of speed. And speed clearly is important when an organism faces a threat to its survival. The indirect pathway carries nerve impulses from the sensory organs (eye or ear, for example) to the thalamus. From the thalamus, the nerve impulses travel to the sensory cortex, which then sends appropriate signals to the amygdala.

The amygdala is also linked with emotional memories. LeDoux (2000, 2001) says that the amygdala hardly ever forgets. This quality is useful because, once we learn that something is dangerous, we don't have to relearn it. However, we pay a penalty for this ability. Many people carry fears that they would like to get rid of but cannot seem to shake. Part of the reason for this dilemma is that the amygdala is well connected to the cerebral cortex, in which thinking and decision making primarily occur (McGaugh & Cahill, 2002). The amygdala is in a much better position to influence the cerebral cortex than the other way around, because it sends more connections to the cerebral cortex than it gets back. This may explain why it is so hard to control our emotions, and why, once a fear is learned, it is so hard to erase.

Researchers are also finding that the cerebral hemispheres may be involved in understanding emotion. Richard Davidson and his colleagues (Davidson 2000; Davidson, Shackman, & Pizzagalli, 2002; Reuter-Lorenz & Davidson, 1981) Davidson, have shown that *approach-related emotions,* such as happiness, are linked more strongly with left-hemisphere brain activity, whereas *withdrawal-related emotions,* such as disgust, show stronger activity in the right hemisphere. (Go to the interactivity "Brain Lateralization" to see which hemisphere you use to process information about emotions.)

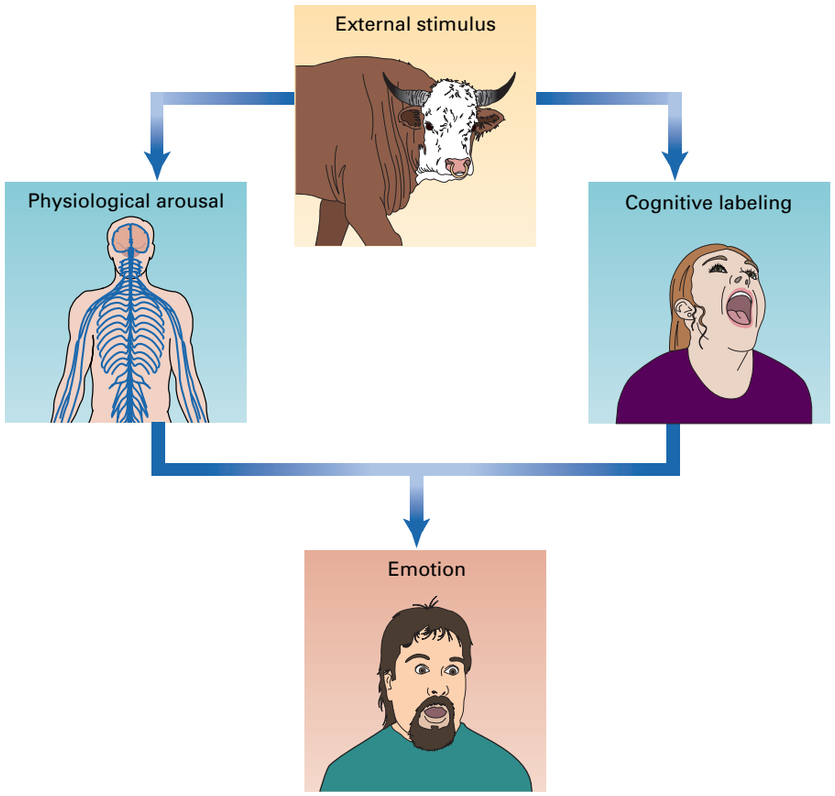


FIGURE 9.13 Two-Factor Theory of Emotion As Schachter and Singer theorize, emotion has both a physiological and an emotional component.

In addition to charting the main brain structures involved in neural pathways of emotions, researchers are intrigued by the roles that neurotransmitters play in these pathways. Endorphins and dopamine might be involved in positive emotions, such as happiness, and norepinephrine might function in regulating arousal (Berridge & O'Neil, 2001; Panskepp, 1993; Robbins, 2000).

Nonbiological Factors in Emotion

Remember that our definition of emotion includes not only a physiological component but also cognitive, behavioral, and sociocultural components. A queasy feeling, for example, may be interpreted as anxiety, love, or indigestion. What the person does in response will also vary, depending on individual factors as well as on the responses suggested by the person's culture.

Cognitive Factors in Emotion Does emotion depend on the tides of the mind? Are we happy only when we think we are happy? Cognitive theories of emotion center on the premise that emotion always has a cognitive component (Derryberry & Reed, 2002; Ellsworth, 2002). Cognitive theorists recognize the role of the brain and body in emotion, but they give cognitive processes the main credit.

According to the **two-factor theory of emotion** developed by Stanley Schachter and Jerome Singer (1962), emotion is determined by physiological arousal and cognitive labeling (see figure 9.13). They argue that we look to the external world for an explanation of why we are aroused. For example, if you feel good after someone has made a pleasant comment to you, you might label the emotion "happy." If you feel bad after you have done something wrong, you might label the feeling

two-factor theory of emotion Schachter and Singer's theory that emotion is determined by two main factors: physiological arousal and cognitive labeling.

FIGURE 9.14 Capilano River Bridge Experiment *(Left)* The precarious Capilano River Bridge in British Columbia. *(Right)* The experiment is shown in progress. An attractive woman approached men while they were crossing the bridge and asked them to make up a story to help her with a creativity project. She also made the same request on a lower, much safer bridge. The men on the Capilano River Bridge told sexier stories, probably because they were aroused by the fear or excitement of being up so high on a swaying bridge and they interpreted their arousal as sexual attraction for the female interviewer.

"guilty." To test their theory, Schachter and Singer (1962) injected volunteer participants with epinephrine, a drug that produces high arousal. Then the participants observed someone else behave in either a euphoric way (shooting papers at a wastebasket) or an angry way (stomping out of the room). As predicted, the euphoric and angry behaviors influenced the participants' cognitive interpretation of their own arousal. When they were with a happy person, they said they were happy; when they were with an angry person, they said they were angry. But this effect occurred only when the participants were not told about the true effects of the injection. When they were told that the drug would increase their heart rate and make them jittery, they said the reason for their own arousal was the drug, not the other person's behavior.

Psychologists have had difficulty replicating Schachter and Singer's experiment, but, in general, research supports the belief that misinterpreted arousal intensifies emotional experiences (Leventhal & Tomarken, 1986). In one intriguing study, Dutton and Aron (1974) substantiated this conclusion. An attractive woman approached men without a female companion while they were walking across the Capilano River Bridge in British Columbia. The woman asked the men to make up a brief story for a project she was doing on creativity. The Capilano River Bridge sways precariously more than 200 feet above rapids and rocks (see figure 9.14). The female interviewer made the same request of other men crossing a lower, much safer bridge. The men on the Capilano River Bridge told more sexually oriented stories and rated the female interviewer as more attractive than did men on the lower, less frightening bridge.

Psychologists continue to debate whether cognition or emotion comes first. Richard Lazarus (1991) believes cognitive activity is a precondition for emotion. He says that we cognitively appraise ourselves and our social circumstances and develop emotions in that context. People may feel happy because they have a deep religious commitment, angry because they did not get the raise they anticipated, or fearful because they expect to fail an exam. Alternatively, Robert Zajonc (1984) says that emotions are primary and our thoughts are a result of them. Who is right? Both likely are. Some of our emotional reactions are virtually instantaneous and probably do not

FIGURE 9.15 Recognizing Emotions in Facial Expressions Before reading further, look at the six faces and determine the emotion reflected in each face. They are *(top row across)* happiness, anger, sadness; *(bottom row across)* surprise, disgust, fear.

involve cognitive appraisal, such as shrieking on detecting a snake. Other emotional circumstances, especially those that occur over a long period, such as a depressed mood or anger toward a friend, are more likely to involve cognitive appraisal. Indeed, neuroscientific research supports the idea that some of our emotional reactions do not involve deliberate thinking, whereas others do (LeDoux, 2000, 2001).

Behavioral Factors in Emotion The behavioral component of emotion can be verbal or nonverbal. Verbally, a person might show love for someone by professing it or might display anger by saying some nasty things. Nonverbally, a person might smile, frown, show a fearful expression, look down, or slouch.

Emotion researchers have been intrigued by people's ability to detect emotion from a person's facial expression. In a typical research study, participants shown photographs like those in figure 9.15 are usually able to identify these six emotions: happiness, anger, sadness, surprise, disgust, and fear (Ekman & O'Sullivan, 1991). (See the video clip "Language of the Face" to learn more about the messages we convey with facial expressions.)

Might our facial expressions not only reflect our emotions but also influence them? The **facial feedback hypothesis** states that facial expressions can influence emotions, as well as reflect them. Facial muscles send signals to the brain, which help individuals to recognize the emotion they are experiencing (Keillor & others, 2002). For example, we feel happier when we smile and sadder when we frown. Support for this hypothesis comes from an experiment by Ekman and his colleagues (1983). Professional actors moved their facial muscles in very precise ways, such as raising their eyebrows and pulling them together, raising their upper eyelids, and stretching their lips horizontally back to their ears. They were asked to hold each expression for 10 seconds, during which time the researchers measured their heart rate and body temperature. When they moved facial muscles as described here, they showed a rise in heart rate and a steady body temperature, physiological reactions that characterize

facial feedback hypothesis The idea that facial expressions can influence emotions, as well as reflect them.

FIGURE 9.16 Emotional Expressions in the United States and New Guinea *(Left)* Two women from the United States. *(Right)* Two men from the Fore tribe in New Guinea. Notice the similarity in their expressions of disgust and happiness. Psychologists believe that the facial expression of emotion is virtually the same in all cultures.

fear. When the actors made an angry expression with their faces (eyes have a penetrating stare, brows are drawn together and downward, and lips are pressed together or opened and pushed forward), their heart rate and body temperature both increased. The concept involved in the facial feedback hypothesis might sound familiar. It provides support for the theory that says emotional experiences can be generated by changes in and awareness of our own bodily states.

Sociocultural Factors in Emotion In *The Expression of the Emotions in Man and Animals,* Charles Darwin (1872/1965) stated that the facial expressions of human beings are innate, not learned; are the same in all cultures around the world; and evolved from the emotions of animals. Darwin compared the similarity of human snarls of anger with the growls of dogs and the hisses of cats. He compared the giggling of chimpanzees when they are tickled under their arms with human laughter.

Today psychologists still believe that emotions, especially facial expressions of emotion, have strong biological ties (Goldsmith, 2002). For example, children who are blind from birth and have never observed the smile or frown on another person's face smile or frown in the same way that children with normal vision do.

If emotions and facial expressions that go with them are unlearned, then they should be the same the world over. The universality of facial expressions and the ability of people from different cultures to accurately label the emotion that lies behind the facial expression has been researched extensively. Psychologist Paul Ekman's (1980, 1996) careful observations reveal that the many faces of emotion do not differ significantly from one culture to another. For example, Ekman photographed people expressing emotions, such as happiness, fear, surprise, disgust, and grief. When researchers showed the photographs to people from the United States, Chile, Japan, Brazil, and Borneo (an Indonesian island in the western Pacific), all tended to label the same faces with the same emotions (Ekman & Friesen, 1968). Another study focused on the way the Fore tribe, an isolated Stone Age culture in New Guinea, matched descriptions of emotions with facial expressions (Ekman & Friesen, 1971). Before Ekman's visit, most of the Fore had never seen a Caucasian face. The similarity of facial expressions of emotions by persons in New Guinea and the United States is shown in figure 9.16. (To learn more about Ekman's research on universal expressions of emotions, listen to the audio clip "Evolutionary Psychology.")

Just as facial expressions are, some other nonverbal signals appear to be universal indicators of certain emotions. For example, when people are depressed, it shows not only in their sad facial expressions but also in their slow body movements, downturned heads, and slumped posture.

In the Middle Eastern country of Yemen, male-to-male kissing is commonplace, but in the United States it is uncommon. *What other forms of nonverbal expression vary across cultures?*

Many nonverbal signals of emotion, though, vary from one culture to another (Cohen & Borsoi, 1996; Mesquita, 2002). For example, male-to-male kissing is commonplace in Yemen but uncommon in the United States. And the "thumbs up" sign, which in most cultures either means everything is okay or signals the desire to hitch a ride, is an insult in Greece, similar to a raised third finger in the United States.

Display rules for emotion also are not culturally universal. **Display rules** are sociocultural standards that determine when, where, and how emotions should be expressed. For example, members of the Utku culture in Alaska discourage anger by cultivating acceptance and by dissociating themselves from any display of anger. If a trip is hampered by an unexpected snowstorm, the Utku do not become frustrated but accept the snowstorm and build an igloo. See the video clip "Cultural Variations in Nonverbal Behavior" for more information on cross-cultural research on nonverbal communication.

Another sociocultural influence in emotion is gender. The stereotype that females are emotional and males are not is a powerful and pervasive image in our culture and many others (Shields, 1991). But females and males are often more alike in the way they experience emotion than the stereotype suggests. Females and males often use the same facial expressions, adopt the same language, and describe their emotional experiences similarly when they keep diaries about their experiences. Both sexes are equally likely to experience love, jealousy, and anxiety in new social situations, anger when they are insulted, grief when close relationships end, and embarrassment when they make mistakes in public (Tavris & Wade, 1984).

When we consider specific emotional experiences, contexts in which emotion is displayed, and certain beliefs about emotion, gender does matter (Shields, 1991). Consider anger. Men are more likely than women to show anger toward strangers (especially other men) when they feel they have been challenged and to turn their anger into aggressive action. Gender differences are also more likely to occur in contexts that highlight social relationships. For example, females are more likely than males to give accounts of emotion that include interpersonal relationships. And females are more likely to express fear and sadness than males are, especially when communicating with their friends and family.

Classification of Emotions

There are more than 200 words for emotions in the English language, indicating the complexity and variety of emotions. A number of psychologists have classified the emotions we experience by placing them on a wheel. One such model was

display rules Sociocultural standards that determine when, where, and how emotions should be expressed.

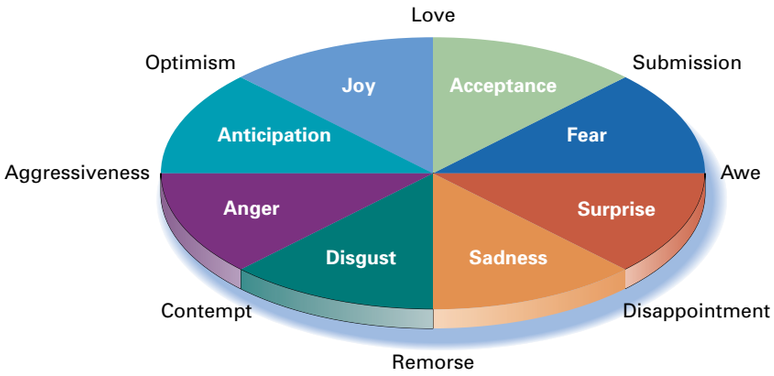


FIGURE 9.17 A Wheel Classification of Emotions Plutchik theorized that people experience the eight primary emotions represented in the colored sections of the drawing, as well as combinations of these emotions, as shown outside the wheel.

proposed by Robert Plutchik (1980). He believes emotions have four dimensions: (1) They are positive or negative, (2) they are primary or mixed, (3) many are polar opposites, and (4) they vary in intensity. For example, think about your ecstasy when you get an unexpected *A* on a test or your enthusiasm about a football game this weekend—these are positive emotions. In contrast, think about negative emotions, such as grief when someone close to you dies or anger when someone verbally attacks you. Positive emotions enhance our self-esteem; negative emotions lower our self-esteem. Positive emotions improve our relationships with others; negative emotions depress the quality of those relationships. Plutchik believes that emotions are like colors. Every color of the spectrum can be produced by mixing the primary colors. Happiness, disgust, surprise, sadness, anger, and fear are candidates for primary emotions. Combining sadness and surprise produces disappointment. Jealousy is composed of love and anger. Plutchik developed the emotion wheel in figure 9.17 to show how primary emotions adjacent to each other produce other emotions. Also note that some emotions are opposites—love and remorse, optimism and disappointment. Theorists such as Plutchik view emotions as innate reactions that require little cognitive interpretation: an evolutionary perspective.

A different approach is to classify emotions along two broad dimensions: positive and negative. **Positive affectivity (PA)** refers to positive emotions, such as joy, happiness, love, and interest. **Negative affectivity (NA)** refers to negative emotions, such as anxiety, anger, guilt, and sadness. Positive emotions facilitate approach behavior (Davidson, 1993; Watson, 2001; Watson & others, 1999). In other words, positive affect increases the likelihood that individuals will interact with their environment and engage in activities that are adaptive for the individual, its species, or both. Positive emotions can broaden people's horizons and build their personal resources. For example, joy broadens by creating the urge to play, push limits, and be creative. Interest broadens by creating the motivation to explore, absorb new information and experiences, and expand the self (Csikzentmihalyi, 1990; Ryan & Deci, 2000). Negative emotions, such as fear, facilitate withdrawal behavior and thus carry direct and immediate adaptive benefits in situations that threaten survival. However, whereas positive emotions tend to broaden a person's attention, negative emotions—such as anxiety and depression—often narrow attention even in nonthreatening situations (Basso & others, 1996).

positive affectivity (PA) Positive emotions, such as joy, happiness, love, and interest.

negative affectivity (NA) Negative emotions, such as anxiety, anger, guilt, and sadness.

There is increasing interest in the role that positive affectivity might play in well-being (Frederickson, 2001). For example, positive emotions appear to improve coping. In one study, individuals who experienced more positive emotions than others developed broader-based coping strategies, such as thinking about different ways to deal with a problem and stepping back from the situation and being more objective (Frederickson & Joiner, 2002). In some cases, positive emotions, such as joy, happiness, love, and interest—may override, or undo the lingering effects of, negative emotions—such as sadness, anger, and despair (Diener, 1999; Frederickson, 2001). For example,

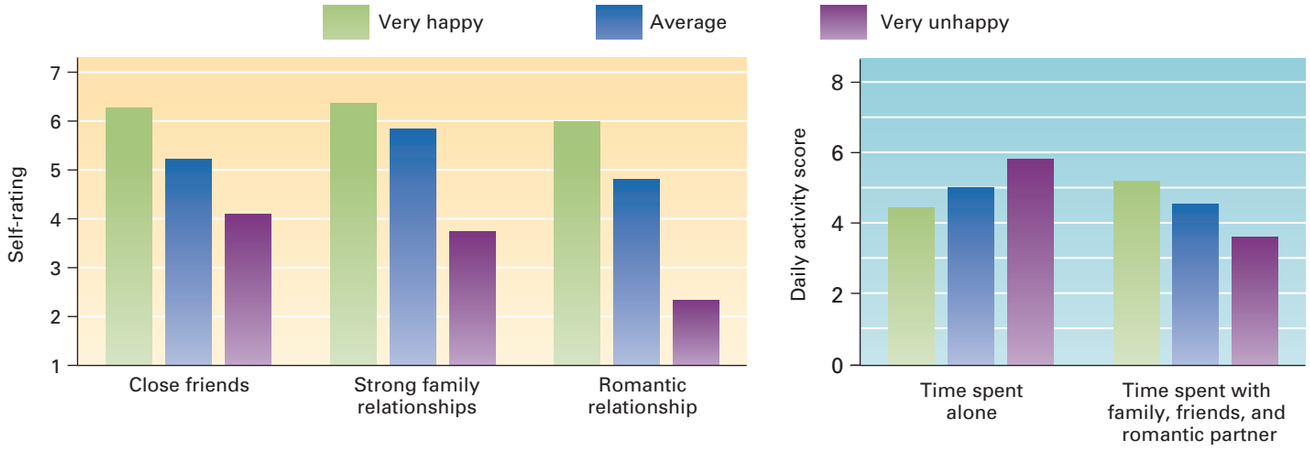


FIGURE 9.18 Characteristics of Very Happy College Students (Diener & Seligman, 2002)
Self-ratings were made on a scale of 1 to 7, with 1 being much below the average of college students on the campus studied (University of Illinois) and 7 being much above the average of college students on the campus. Daily activity scores reflect mean times, with 1 representing no time and 10 reflecting 8 hours per day.

mild joy and contentment have been found to undo the lingering cardiovascular effects of negative emotions, such as sadness (Frederickson & Levenson, 1998). In sum, positive emotions likely serve important functions in an individual's adaptation, growth, and social connection. By building personal and social resources, positive emotions improve people's well-being.

One aspect of positive emotion that is increasingly being studied is happiness. Psychologists' interest in happiness focuses on positive ways we experience life, including cognitive judgments of our well-being (Diener, Lucas, & Oishi, 2001; Locke, 2002). That is, psychologists want to know what makes you happy and how you perceive your happiness. Recent research reviews indicate that these factors are linked with happiness (Diener & Seligman, 2002; Diener & others, 1999):

- Psychological and personality characteristics: high levels of self-esteem, optimism, extraversion, and personal control
- A supportive network of close relationships
- A culture that offers positive interpretations of most daily events
- Being engaged by work and leisure
- A faith that embodies social support, purpose, hope, and religious attendance

The importance of close relationships in happiness was documented in a recent study of what makes college students happy (Diener & Seligman, 2002). College students were divided into three groups: very happy, average, and very unhappy. The very happy college students were highly social, were more extraverted, and had stronger romantic and social relationships than the less happy college students (see figure 9.18).

Review and Sharpen Your Thinking

5 ***Summarize the factors that influence emotion.***

- Explain the biology of emotion in terms of arousal and neural activity.
- Discuss the roles of cognition, behavior, and sociocultural similarities and differences in the expression of emotion.
- Compare two models for classifying emotions.

Think about the last time you became angry. How did biological, cognitive, behavioral, and sociocultural factors influence your interpretation and expression of anger?

Reach Your Learning Goals

Motivation and Emotion

1 APPROACHES TO MOTIVATION

2 HUNGER

- Biology of Hunger
- Dieting
- Obesity and Overeating
- Eating Disorders

3 SEXUALITY

- Biology of Sex
- Psychosexual Dysfunctions
- Sexual Orientation
- Nonbiological Factors in Sexuality
- Sexual Attitudes and Practices

4 NEED FOR ACHIEVEMENT

- Cognitive Factors in Achievement
- Sociocultural Factors in Achievement

5 EMOTION

- Biology of Emotion
- Nonbiological Factors in Emotion
- Classification of Emotions

1 Describe five psychological views of motivation.

- Motivation gives our behavior, thoughts, and feelings a purpose. Early evolutionary theorists considered motivation to be based on instinct, the innate biological pattern of behavior that is assumed to be universal throughout a species; the idea that some of our motivation is unlearned and involves physiological factors is still present in the evolutionary approach today. Drive reduction theory relies on the concept of drive, an aroused state that occurs because of a physiological need; the goal of drive reduction is homeostasis, the body's tendency to maintain an equilibrium. Optimum arousal theory states that performance is best under conditions of moderate rather than low or high arousal, although at times low or high arousal is linked with better performance. The cognitive approach emphasizes the effect on motivation of such information processing abilities as attention, memory, and problem solving; intrinsic motivation, based on internal factors such as self-determination, curiosity, challenge, and effort, contrasts with extrinsic motivation, based on external incentives such as rewards and punishments. According to Maslow's hierarchy of needs, our main needs are satisfied in this sequence: physiological, safety, love and belongingness, esteem, and self-actualization.

2 Explain what motivates people to eat and to eat too much or too little.

- Stomach signals are one biological factor linked to hunger. Another is glucose (blood sugar), probably because the brain is critically dependent on sugar for energy. Leptin, a protein secreted by fat cells, decreases food intake and increases energy expenditure. The hypothalamus plays an important role in regulating hunger, one part involved in stimulating eating and another part in restricting eating. Today, neuroscientists are exploring the roles that neurotransmitters and neural circuits play in hunger.
- Obesity is a serious and pervasive problem in the United States. Heredity, basal metabolism, set point, and fat cells are biological factors involved in obesity. Obese persons are more responsive to external eating cues than normal-weight persons are, although some individuals at all weight levels respond more to external than to internal stimuli. Time and place affect eating, as does the type of food available. Self-control is an important cognitive factor in eating behavior. The dramatic increase in obesity in the late twentieth century underscores the significance of environmental factors in obesity as increasing numbers of people eat high-fat foods and lead sedentary lives.
- Dieting for weight loss and restrained eating for weight control are common in American society. Most diets don't work over time, unless they are combined with exercise. The pressure to be thin and diet can be harmful for people who are not overweight. However, when overweight people diet and maintain their weight loss, they reap health benefits.
- Anorexia nervosa is an eating disorder that involves the relentless pursuit of thinness through starvation. Bulimia nervosa is an eating disorder that consists of a binge-and-purge pattern. Both disorders are most common among adolescent and young adult females.

3 Discuss the motivation for sex.

- Motivation for sexual behavior involves the hypothalamus. The pituitary gland controls the secretion of two classes of sex hormones: estrogens, which predominate in females, and androgens, which predominate in males. The role of sex hormones in human sexual behavior, especially in women, is not clear. Masters and Johnson mapped out the human sexual response pattern, which consists of four physiological phases: excitement, plateau, orgasm, and resolution.
- Thoughts and images are central in the sexual lives of humans. Sexual scripts influence sexual behavior, as do sensory/perceptual factors. Females tend to be more sexually aroused by touch, males by visual stimulation. Pheromones are sexual attractants for many nonhuman animals, but their role in human sexual behavior has not been documented. Many substances allegedly act as aphrodisiacs, or sexual stimulants, but there is no clear evidence that what we eat, drink, or inject has aphrodisiac qualities. Sexual values vary extensively across cultures. These values exert significant effects on sexual behavior.
- Psychosexual dysfunctions involve impairments in the sexual response pattern. Significant advances have been made in treating these dysfunctions in recent years. Most effective are treatments of specific dysfunctions in sexual response.
- Describing sexual practices in America has always been challenging due to the difficulty of surveying a representative sample of the population. The 1994 *Sex in America* survey was a major improvement over earlier surveys. It revealed that Americans' sex lives are more conservative than earlier surveys had indicated.
- Sexual orientation—heterosexual, homosexual, or bisexual—is most likely determined by a combination of genetic, hormonal, cognitive, and environmental factors.

4 *Explain why people are motived to achieve.*

- Early interest in achievement focused on the need for achievement. Cognitive factors in achievement include intrinsic motivation, attribution, and self-generated goals. Attribution theory states that people are motivated to discover the underlying causes of behavior in an effort to make sense of it. The main emphasis in attribution theory has focused on internal causes, especially effort, and external causes. High achievers often set specific, short-term, challenging goals. Individuals in the United States are more achievement-oriented than individuals in many other countries, although recent comparisons with Asian countries indicate a higher value placed on achievement in those countries. A special concern is accurately determining effects of ethnicity on achievement. Socioeconomic status (SES) usually is a better predictor of achievement than ethnicity.

5 *Summarize the factors that influence emotion.*

- Emotion is feeling, or affect, that has three components: physiological arousal, conscious experience, and behavioral expression. The biology of emotion focuses on physiological arousal involving the autonomic nervous system and its two subsystems. The galvanic skin response and the polygraph have been used to measure emotional arousal. The polygraph is considered unreliable for use as a lie detector. One early theory states that emotion follows physiological states triggered by environmental stimuli. Another early theory states that emotion and physiological reactions occur simultaneously. However, contemporary biological views of emotion increasingly highlight neural circuitry and neurotransmitters. Positive and negative emotions appear to use different neural circuitry and neurotransmitters.
- One cognitive theory of emotion states that emotion is the result of both physiological arousal and cognitive labeling. It appears that cognition sometimes directs emotion and that emotion sometimes directs cognition. Research on the behavioral component of emotion focuses on facial expressions. The facial feedback hypothesis states that facial expressions can influence emotions, as well as reflect them. Most psychologists believe that facial expressions of basic emotions are the same across cultures. However, display rules, which involve nonverbal signals of body movement, posture, and gesture, vary across cultures. The gender stereotype that women are emotional and men are not is belied by the similarity of emotions in both genders. However, context often influences the expression of emotion by males and females.
- Classifications of emotions have included wheel models and the two-dimensional approach. Plutchik's wheel model portrays emotions in terms of four dimensions: positive or negative, primary or mixed, polar opposites, and intensity. The two-dimensional approach to classifying emotions argues that there are just two broad dimensions of emotional experiences: positive affectivity and negative affectivity.

Key Terms

motivation, p. 315
instinct, p. 315
drive, p. 315
need, p. 315
homeostasis, p. 315
intrinsic motivation, p. 316
extrinsic motivation, p. 316
hierarchy of needs, p. 317
self-actualization, p. 317
basal metabolism rate (BMR), p. 321
set point, p. 321
anorexia nervosa, p. 323
bulimia nervosa, p. 323
estrogens, p. 325
androgens, p. 325
human sexual response pattern, p. 325
sexual scripts, p. 326
pheromones, p. 327
psychosexual dysfunctions, p. 328
need for achievement, p. 333
attribution theory, p. 333
emotion, p. 337
polygraph, p. 338
two-factor theory of emotion, p. 341
facial feedback hypothesis, p. 343
display rules, p. 345
positive affectivity (PA), p. 346
negative affectivity (NA), p. 346

Apply Your Knowledge

1. Ask your friends to define the word *motivation.* Think about the way they define it and the way psychologists approach motivation. What are the similarities? What are the differences? Are your friends likelier to say they have too much motivation or not enough? Why might that be?
2. Do a web search for the word *hunger.* What kinds of sites are listed first? How do the topics that these sites cover compare with the discussion of hunger in the chapter? Do the sites give you any insight into the role of environment in hunger?
3. Imagine that someone offered you a pill that would double the size of your lateral hypothalamus but make your androgen levels go down to half their current level. How might this pill affect your eating and sexual behavior? Would you take the pill?
4. How much of our interpretation of emotions depends on verbal or nonverbal cues? Try the following exercise: Watch a movie that you're not familiar with and find a scene with a number of people in it. First, watch the scene with the sound off and try to guess what emotions are being experienced by each person; describe the nonverbal cues that led you to your conclusions. Then, find a different scene, and listen to it without watching to guess what emotions are being experienced; describe the verbal cues that you used. Then, watch both scenes with the sound on. Were verbal or nonverbal cues more useful?

Connections

To test your mastery of the material in this chapter, go to the Study Guide and the In-Psych Plus CD-ROM, as well as the Online Learning Center. There you will find a chapter summary, practice tests, flashcards, lecture slides, web links, and other study tools, such as interactive exercises and reviews as well as current, chapter-relevant news articles.