

11

Motivation and Emotion



Chapter Outline

Learning Goals

APPROACHES TO MOTIVATION

1

Describe psychological approaches to motivation.

- The Evolutionary Approach
- ▼
- Drive Reduction Theory
- ▼
- Optimum Arousal Theory
- ▼
- The Cognitive Approach
- ▼
- Maslow's Hierarchy of Human Needs
- ▼
- Issues in Motivation

HUNGER

2

Explain the physiological basis of hunger and the nature of eating behavior.

- The Biology of Hunger
- ▼
- Obesity and Eating Behavior
- ▼
- Dieting
- ▼
- Eating Disorders

SEXUALITY

3

Discuss the motivations for sexual behavior.

- The Biology of Sex
- ▼
- Cognitive and Sensory/Perceptual Factors
- ▼
- Cultural Factors
- ▼
- Psychosexual Dysfunctions
- ▼
- Sexual Behavior and Orientation

SOCIAL COGNITIVE MOTIVES

4

Characterize the social cognitive motives and how they influence behavior.

- Achievement
- ▼
- Affiliation
- ▼
- Well-Being

EMOTION

5

Summarize views of emotion.

- The Biology of Emotion
- ▼
- Cognitive Factors
- ▼
- Behavioral Factors
- ▼
- Sociocultural Factors
- ▼
- Classifying Emotions

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 when he began chemotherapy.

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:

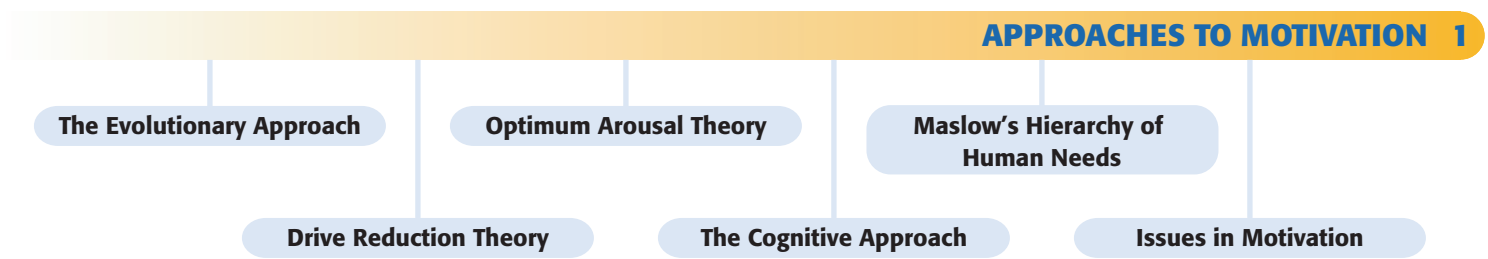
- *Motivation.* The intense motivation required to make it through grueling practices, day after day; the motivation to battle cancer and defeat it; the motivation to set a goal of winning the Tour de France and then winning it; the motivation to improve his personal life by getting married and starting 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.

Hunger, sex, achievement, affiliation, and well-being are five important motives in our lives. Hunger is usually described as a biological motive, sex is categorized as a bridge between biological and social cognitive motives, and achievement, affiliation, and well-being are portrayed as social cognitive motives. Each of these areas of motivation is examined in greater depth in the chapter.

Motivations differ not only in kind, such as an individual being motivated to eat rather than have sex, but also in intensity. We can speak of an individual as being more or less hungry or more or less motivated to have sex. The first section looks at different approaches to motivation.



Lance Armstrong after winning the Tour de France in 2003.



How do psychologists think about motivation?

We are all motivated, but some of us are motivated to do different things. Thus some students are motivated to watch television, others to study for an exam. **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. This section explores the main approaches to motivation, beginning with the evolutionary approach, which emphasizes the biological basis of motivation.

The Evolutionary Approach

Early in psychology's history, the evolutionary approach emphasized the role of instincts in motivation. Ethology also has described motivation from an evolutionary perspective.

An **instinct** is an innate (unlearned), biological pattern of behavior that is assumed to be universal throughout a species. A student of Darwin's evolutionary theory, American psychologist William McDougall (1908), argued that all behavior involves instincts. In particular, he said that we have instincts for acquisitiveness, curiosity, pugnacity, gregariousness, and self-assertion. At about the same time, Sigmund Freud (1917) argued that behavior is based on instinct. Freud believed that sex and aggression were especially powerful instincts.

It was not long before a number of psychologists had crafted laundry lists of instincts, some lists running to thousands of items. However, it soon became apparent that what the early instinct theorists were doing was naming a behavior rather than explaining it. If we say that people have an instinct for sex, for curiosity, or for acquisitiveness, we are merely naming these behaviors, not explaining them.

Although the approach of merely labeling behaviors as instincts landed in psychology's trash heap many years ago, the idea that some motivation is unlearned is still alive and well today. It is widely accepted that instinctive behavior is common in nonhuman species, and in chapter 4 you learned that human infants come into the world equipped with some unlearned instincts, such as sucking. Most attachment theorists also believe that infants have an unlearned instinct for orienting toward a caregiver.

Recently, evolutionary psychology, which was discussed in chapters 1 and 3, has rekindled interest in the evolutionary basis of motivation. According to evolutionary psychologists, the motivation for sex, aggression, achievement, and other behaviors is 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

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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.

deprivation that energizes the drive to eliminate or reduce the deprivation. You might have a need for water, for food, or for sex. 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. *Drive reduction theory* explains that, as a drive becomes stronger, we are motivated to reduce it.

Usually, but not always, needs and drives are closely associated in time. For example, when your body needs food, your hunger drive will probably be aroused. An hour after you have eaten a hamburger, you might still be hungry (thus you need food), but your hunger drive might have subsided. From this example, you can 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, oxygenation, 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.

An analogy for homeostasis is the thermostat that keeps the temperature constant in a house. For example, assume that the thermostat in your house is set at 68° during the winter. The furnace heats the house to 68°, and then the furnace shuts off. Without a source of heat, the temperature in the house eventually falls below 68°—if the outside temperature is below 68°. The thermostat detects this change and turns the furnace back on again. The cycle is repeated so that the temperature is maintained within narrow limits. Today, homeostasis is used to explain both physiological 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. Consider also people who seek stimulation and thrills—say, by bungee jumping or riding a roller coaster. Instead of reducing a drive, they appear to be increasing their level of stimulation.

Optimum Arousal Theory

The circumstance just described—seeking stimulation and thrills—suggests that individuals seek arousal (a state of alertness or activation) in their lives. Is there an optimum level of arousal that motivates behavior? Early in the 20th century, two psychologists described what optimum arousal might be. Their formulation, now known as the **Yerkes-Dodson law**, states that performance is best 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 how aroused you were the last time you took a test. If your arousal was too high, your performance probably suffered. If it was too low, you may not have worked fast enough to finish the test. Also, think about performance in sports. Being too aroused usually harms athletes' performance. For example, a thumping heart and rapid breathing have accompanied many golfers' missed putts and basketball players' failed free-throw attempts. However, if athletes' arousal is too low, they may not concentrate well on the task at hand.

Moderate arousal often serves us best in tackling life's tasks, but there are times when low or high arousal produces optimal performance. 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

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

Yerkes-Dodson law States that performance is best under conditions of moderate arousal than under those of low or high arousal.

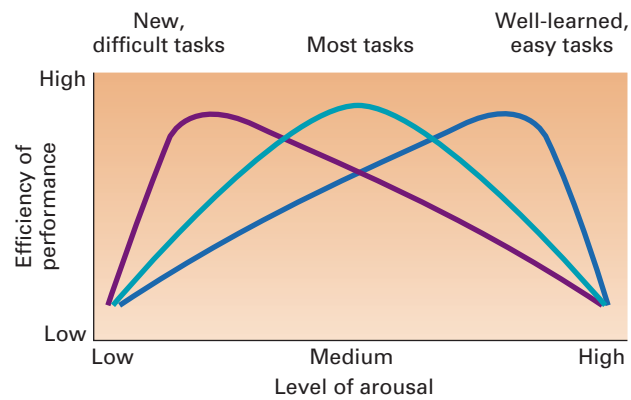


FIGURE 11.1 Arousal and Performance The Yerkes-Dodson law states that optimal performance occurs under moderate arousal. However, for new or difficult tasks, low arousal may be best; for well-learned, easy tasks, high arousal may be best.

algebraic equation), much lower arousal is preferred. Figure 11.1 projects how arousal might influence easy, moderate, and difficult tasks. As tasks become more difficult, the ability to be alert and attentive but relaxed is critical to optimal performance.

As mentioned earlier, some people seek a great deal of stimulation in their lives and enjoy the thrill of engaging in risky behavior. *Sensation seeking* is the motivation to experience varied, novel, complex, and intense sensations and experiences. It also involves the willingness to take risks just for the sake of such an experience.

Zuckerman and colleagues (Zuckerman, 1994, 2000; Zuckerman & others, 1993) have found that high sensation seekers are more likely than low sensation seekers to

- Be motivated to engage in sports such as mountain climbing, parachuting, hang gliding, scuba diving, car and motorcycle racing, and downhill skiing
- Be attracted to vocations involving exciting experiences, such as firefighting, emergency-room work, and air traffic control (when confined to monotonous desk jobs, they report high job dissatisfaction)
- Drink heavily, smoke, and use illicit drugs
- Have a short-term hedonistic attitude toward intimate relationships (high sensation seekers also tend to engage in more varied sexual activities with more partners)

The Cognitive Approach

The contemporary view of motivation emphasizes cognitive factors (Brophy, 2004; Zimmerman & Schunk, 2001; Schunk, 2004). Consider your motivation to do well in this class. Your confidence in your ability to do well and your expectation for success may help you to relax, concentrate better, and study more effectively. If you think too much about not doing well in the class and fear that you will fail, you can become too anxious and not perform as well. Your ability to consciously control your behavior and resist the temptation to party too much and avoid studying will improve your achievement, as will your ability to use your information processing abilities of attention, memory, and problem solving as you study for and take tests.

Psychologists continue to debate the role of conscious versus unconscious thought in understanding motivation. Freud's legacy to contemporary psychodynamic theory is the belief that we are largely unaware of why we behave the way we do. Psychodynamic theorists argue that few of us know why we love someone, why we eat so much, why we are so aggressive, or why we are so shy. Although some cognitive psychologists have begun to study the role of the unconscious mind, for the most part, they 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.

Intrinsic and Extrinsic Motivation Intrinsic motivation is another important aspect of the cognitive approach to motivation. **Intrinsic motivation** is based on internal factors, such as self-determination, curiosity, challenge, and effort. **Extrinsic motivation** involves 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).

Almost every boss, parent, or teacher has wondered whether to offer a reward to someone who does well (extrinsic motivation) or whether to let the results of the individual's self-determined efforts be the reward (intrinsic motivation). If someone is producing shoddy work, seems bored, or has a negative attitude, offering incentives may improve motivation. But there are times when external rewards can diminish achievement motivation. One study showed that, among students who already had a strong interest in art, those who did not expect a reward spent more time drawing than did their counterparts who knew they would be rewarded for drawing (Lepper, Greene, & Nisbett, 1973). The problem with using a reward as an incentive is that individuals may perceive that the reward rather than their own motivation to be competent caused their achievement behavior.

Many psychologists believe intrinsic motivation has more positive outcomes than extrinsic motivation (Alderman, 2004; Brophy, 2004; Deci & Ryan, 1994; Ryan & Deci, 2000, 2001). They argue that intrinsic motivation is more likely to produce competent behavior and mastery. Indeed, research comparisons often reveal 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).

Especially important to these psychologists is the idea that self-determination (which is intrinsic) produces a sense of personal control that benefits the individual. In this view, individuals do something because of their own will, not because of external success or rewards (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 (Stipek, 1996, 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 motivated (are highly competitive). Lance Armstrong is a good example. Armstrong had an incredible amount of intrinsic motivation to come back from testicular cancer to win the Tour de France. However, the extrinsic motivation of winning the Tour de France trophy and the millions of dollars in endorsement contracts also likely played a role in his motivation. For the most part, though, psychologists believe that intrinsic motivation is the key to achievement. Lance Armstrong, like many other athletic champions, decided early on that he was training and racing for himself, not for his parents, coaches, or the medals. To read further about intrinsic and extrinsic motivation, see the Critical Controversy box.

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

extrinsic motivation Involves external incentives, such as rewards and punishments.

The Importance of Self-Generated Goals Currently, there is considerable interest in studying people's self-generated goals (Eccles & Wigfield, 2002). Some examples of these goals are personal projects, life tasks, and personal strivings. Personal projects can range from trivial pursuits (such as letting a bad haircut grow out) to life goals (such as becoming a good parent). Life tasks are problems individuals currently are working on. They usually focus on normal life transitions, such as going

Does Extrinsic Motivation Undermine Intrinsic Motivation?

The distinction between intrinsic and extrinsic motivation is well established in psychology. 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, 2001). Also, extrinsic motivation is thought to reduce intrinsic motivation (Lepper & others, 1973). A wide variety of social (extrinsic) events, such as deadlines, surveillance (Enzle & Anderson, 1993) and coercive rewards (Enzle, Roggeveen, & Look, 1991), can reduce the enjoyment (intrinsic motivation) associated with work, play, and study. These ideas have exerted a broad influence in educational and occupational settings, where teachers and employers seek to increase the intrinsic motivation of their students and employees, respectively (Stipek, 2002; Wigfield & Eccles, 2002).

Recently, however, two reviews of studies on intrinsic and extrinsic motivation (Deci & others, 1999; Cameron & others, 2001) reached opposite conclusions. Edward Deci and his colleagues (1999) analyzed 128 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 145 studies by Judy Cameron and her colleagues (2001) yielded mixed results. Cameron's group 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 reinforcers, such as money or prizes, often undermine intrinsic motivation, whereas verbal reinforcers, such as praise, can actually enhance intrinsic motivation (Carton, 1996). 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 motivated 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 motivation." 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 intrinsically 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 when 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?

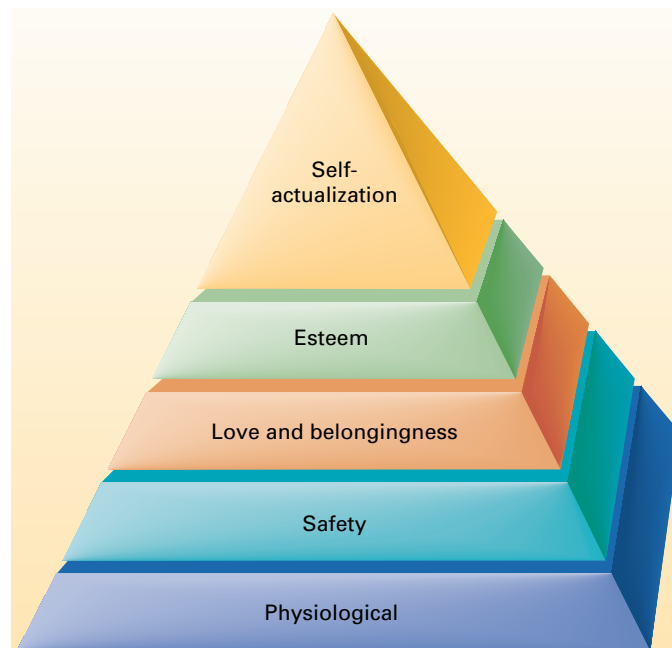


FIGURE 11.2 Maslow's Hierarchy of Needs Abraham Maslow developed the hierarchy of human needs to show that we have to satisfy basic physiological needs before we can satisfy other, higher needs.

to college, getting married, and entering an occupation. Many college students say that their life tasks revolve around academic achievement and social concerns (Cantor & Langston, 1989). Personal strivings represent what a person is typically trying to do. For example, someone might say that she typically tries to do well in school. Later, in discussing achievement, I explore goal setting in greater detail.

Maslow's Hierarchy of Human Needs

Is getting an *A* in this class more important than eating? If the person of your dreams told you that you were marvelous, would that motivate you to throw yourself in front of a car for the person's safety? According to the humanistic theorist Abraham Maslow (1954, 1971), our basic needs must be satisfied before our higher needs can be. Maslow's **hierarchy of needs** states that individuals' main needs are satisfied in the following sequence: physiological, safety, love and belongingness, esteem, and self-actualization (see figure 11.2). According to this hierarchy, people are motivated to satisfy their need for food first, and their need for safety must be satisfied before their need for love.

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. Many of Maslow's writings focus on how people can reach this elusive motivational state. Self-actualization is discussed further in chapter 12 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 of the needs is somewhat subjective. Some people might seek greatness in a career to achieve self-esteem, while putting on hold their needs for love and belongingness.



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 motivation to develop one's full potential as a human being.

Issues in Motivation

In the discussion of dimensions of motivation, three important issues were discussed: (1) To what degree are we motivated by innate, unlearned, biological factors as opposed to learned, experientially based factors? (2) To what degree are we aware of what motivates us—that is, to what extent is our motivation conscious? (3) To what degree are we internally or externally motivated? These are issues that researchers continue to wrangle with and debate.

Keep in mind that, although I separated the biological, cognitive, and behavioral/social/cultural underpinnings of motivation for the purpose of organization and clarification, in reality they are often interrelated. For example, in the study of social cognition, psychologists call attention to how contextual/social factors interact with thinking to determine our motivation. Thus a person's achievement motivation might be influenced by both the person's optimistic outlook (cognitive) and his or her relationship with an outstanding mentor (social).

Review and Sharpen Your Thinking

1 Describe psychological approaches to motivation.

- Define motivation and instinct and explain the evolutionary approach to motivation.
- Summarize drive reduction theory.
- Discuss optimum arousal theory.
- Identify the cognitive factors involved in emotion.
- Characterize Maslow's hierarchy of human needs.
- List three main issues in motivation research.

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.

HUNGER 2

The Biology of Hunger

Dieting

Obesity and Eating Behavior

Eating Disorders

What is the physiological basis of hunger and the nature of eating behavior?

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?

The 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. What role, if any, do such gastric 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

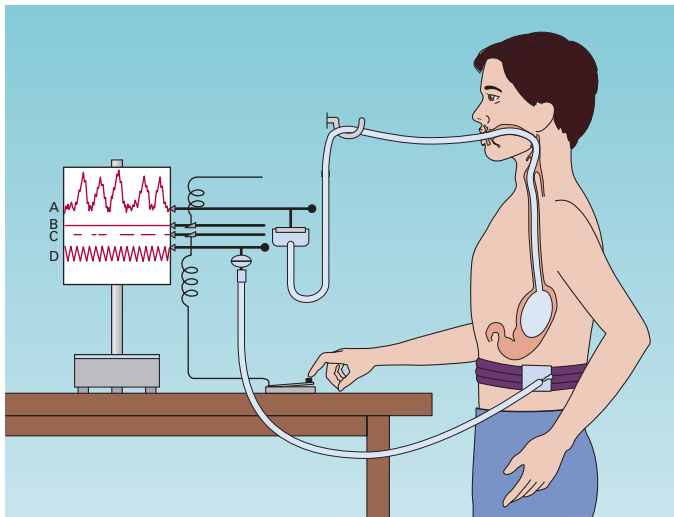


FIGURE 11.3 Cannon and Washburn's Classic Experiment on Hunger In this experiment, the researchers demonstrated that stomach contractions, which were detected by the stomach balloon, accompany a person's hunger feelings, which were indicated by pressing the key. Line A in the chart records increases 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 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.

(see figure 11.3). 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. 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. And the stomach may contract to signal hunger, but the stomach also can 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. The hormone *cholecystokinin* (*CCK*) helps start the digestion of food, travels to the brain through the bloodstream, and signals you to stop eating (Naslund, Hellstrom, & Kral, 2001). As explained in the following sections, there is a lot more involved in hunger than an empty stomach.

Blood Chemistry Three important chemical substances are involved in hunger, eating, and satiety (the sense of being filled and not wanting to eat more): glucose, insulin, and leptin.

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 also can make you hungry.

Another important factor in blood sugar control is the hormone *insulin*, which causes excess sugar in the blood to be stored in cells as fats and carbohydrates (Laboure & 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 but then fall off gradually. When we consume simple sugars such as candy bars and Cokes, 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 eat 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.

Another chemical substance, called *leptin* (from the Greek word *leptos*, which means “thin”), is involved in satiety. Leptin, a protein that is released by fat cells, decreases food intake and increases energy expenditure (Mito & others, 2004; Oberbauer & others, 2001). The role of leptin in long-term satiety was discovered in a strain of *ob* mice, genetically obese mice (Campfield & others, 1995; Carlson, 2001). The *ob* mouse has a low metabolism, overeats, and gets extremely fat. A particular gene called *ob* normally produces leptin. However, because of a genetic mutation, the fat cells of *ob* mice cannot produce leptin. Leptin strongly affects metabolism and eating, acting as an antiobesity hormone (Misra & others, 2001). If *ob* mice are

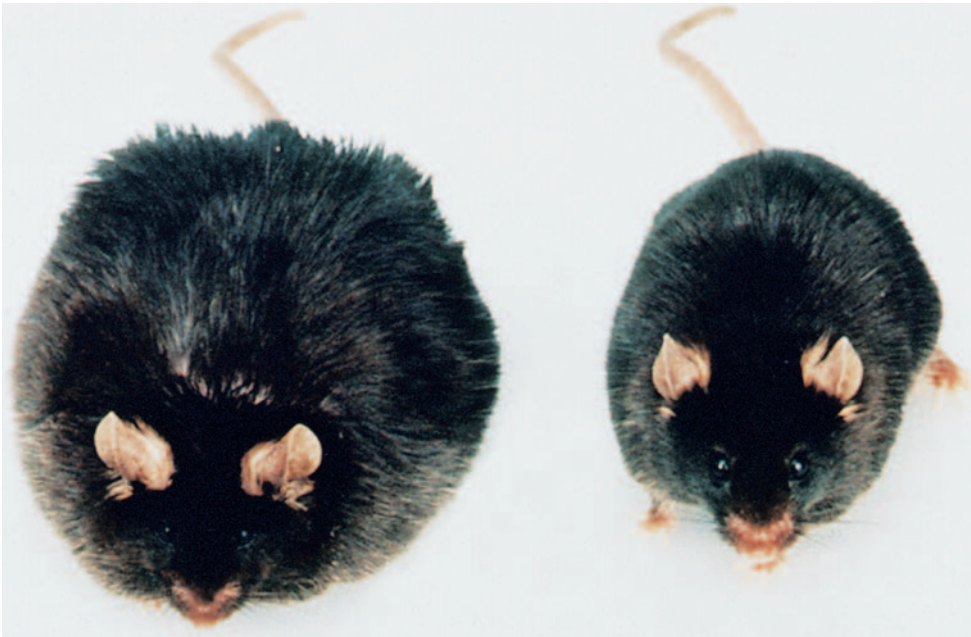


FIGURE 11.4 Leptin and Obesity

The ob mouse on the left is untreated; the one on the right has been given injections of leptin.

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 11.4 shows an untreated ob mouse and an ob mouse that has received injections of leptin.

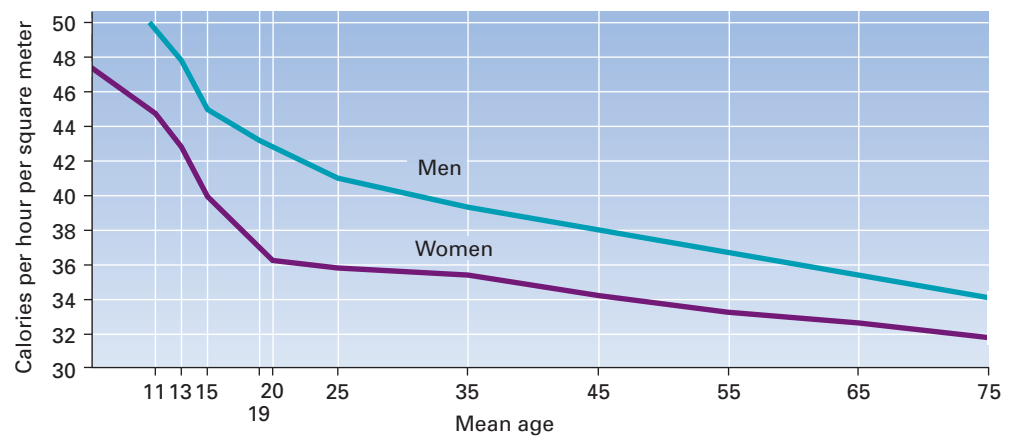
In humans, leptin concentrations have been linked with weight, percentage of body fat, weight loss in a single diet episode, and cumulative percentage of weight loss in all diet episodes (Benini & others, 2001; Van Dielen & others, 2002). Today, scientists are interested in the possibility that leptin might help obese individuals lose weight (Wauters & others, 2001).

Brain Processes Chapter 3 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 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, although the lateral and ventromedial hypothalamus play roles in hunger, there is much more to the brain's role in determining hunger than these on/off centers in the hypothalamus. They are exploring how neurotransmitters (the chemical messengers that convey information from neuron to neuron) 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 neuropeptide neurotransmitter in the hypothalamus that induces eating (Cowley & others, 2001; Sorenson & others, 2002). The neurotransmitter serotonin is partly responsible for the satiating effect of CCK, and serotonin antagonists 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 the hypothalamus (Carlson, 2001). The neural circuitry also extends to the cerebral cortex, where humans make decisions about whether to eat or not to eat.

FIGURE 11.5 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.



Obesity and Eating Behavior

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.

The 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 (Damcott, Sack, & Shuldiner, 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.

Another factor in weight is **basal metabolism rate (BMR)**, the minimal amount of energy an individual uses in a resting state (Marra & others, 2002). BMR varies with age and sex. It declines precipitously during adolescence and then more gradually in adulthood; it is slightly higher for males than for females (see figure 11.5). Many people gradually increase their weight over many years. To some degree, this weight gain can be due to a declining basal metabolism rate.

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—because of genetic predisposition, childhood eating patterns, or adult overeating—the number of their fat cells increases, and they might not be able to get rid of extra ones. 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

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.

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 (Rosenbaum, Leibel, & Hirsch, 1997).

Cognitive and Sociocultural Factors in Hunger and Obesity

Not too long ago, we believed that obesity was caused by such factors as unhappiness and response to 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 external cues, Rodin says that, although obese persons are more responsive to external food cues than normal-weight persons are, there are individuals at all weight levels who respond more to external than to internal stimuli. Many persons 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. Learned associations of food with a particular place and time are characteristic of organisms (Bloom & others, 2001). 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 eating and feel uncomfortable if they aren't eating something while they are watching TV.

The human gustatory system and taste preferences developed at a time when reliable food sources were scarce. Our earliest ancestors probably developed a preference for sweets, because ripe fruit, which is a concentrated source of sugar (and calories), was so accessible. Today many people still have a "sweet tooth," but, unlike our ancestors' ripe fruit that contained sugar *plus* vitamins and minerals, the soft drinks and candy bars we snack on today often fill us with nutrient-free calories.

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 11.6, obesity among adolescents in the United States has increased significantly since the late 1960s (National Center for Health Statistics, 2000b). This dramatic increase likely is due to greater availability of food (especially food high in fat), energy-saving devices, and declining physical activity. Obesity is six times more prevalent among women with low incomes than among women with high incomes. Also, 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, fast-food restaurants, at work. Nowhere else in the world will you find as many fast-food restaurants as in the United States. Also, both portion size and the quantity of food that people eat at mealtime in the United States have grown. Fast-food restaurants capitalize on this by giving 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 hear a lot about exercise in the media and although people talk about exercising, there is good evidence that Americans overall are getting less exercise than they did in the past (National Center for Health Statistics, 2000b).

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.

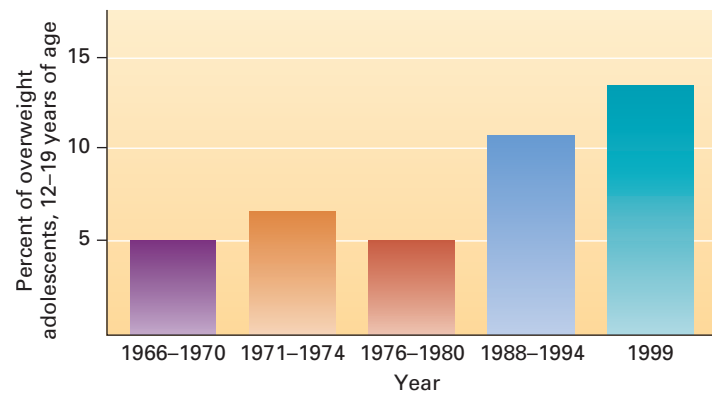


FIGURE 11.6 The Increase in Adolescent Obesity from 1966 to 1999 in the United States

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, “I fell in love with the field of psychology.” In her book, *Body Traps* (1993), Rodin argued 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 trap of using goods and being thin as the measure of their self-worth.



Dieting

Ironically, even as obesity is on the rise, dieting has become an obsession with many Americans. This section explores a number of factors in dieting, beginning with restrained eating.

Restrained Eaters 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 often on diets, 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 Use and Misuse of Diets The topic of dieting is of great interest to many diverse groups 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, aesthetic 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 and a growing minority of the press, who, although they recognize that the rate of obesity is alarming, 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. Some critics argue that all diets fail (Wooley & Garner, 1991). However, studies show that some individuals do lose weight and maintain the loss (Brownell & Cohen, 1995). How often this occurs and whether some diet programs work better than others are still open questions.

What we do know about losing weight is that the most effective programs include an exercise component (Jakicic, 2003; Sothorn & others, 2002). Exercise not only

burns calories but also continues to elevate the person's metabolic rate for several hours *after* the exercise. Also, as indicated earlier, exercise may lower a person's set point for weight, which makes it easier to maintain a lower weight (Bennett & Gurin, 1982).

Dieting is a pervasive concern of many Americans, but the population is not uniform, and 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.

Even when diets produce healthy weight loss, they can 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 (“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.

When overweight people diet and maintain their weight loss, however, they do become less depressed and reduce their risk for a number of health-impairing disorders (Christensen, 1996). The next section explores problems at the other end of the weight spectrum—people who become so thin that it impairs their health.



Eating Disorders

This section examines two major eating problems, anorexia nervosa and bulimia nervosa, both of which 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). Are you satisfied with your body? Go to the interactivity “Perception of Body Shape” to assess your own body image. 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 for themselves and become stressed about failing to reach them; they are intensely concerned about how others perceive them (Striegel-Moore, Silberstein, & Rodin, 1993). Unable to meet their high expectations, they turn to something they can control: their weight.

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



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

The fashion image in the American culture that emphasizes that “thin is beautiful” contributes to the incidence of anorexia nervosa (Simpson, 2002). This image is reflected in the saying “You never can be too rich or too thin.” The media portray thin as beautiful in their choice of models, whom many females want to emulate.

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 (Strober, Freeman, & Morrell, 1997).

Bulimia Nervosa **Bulimia nervosa** is an eating disorder in which the individual consistently follows a binge-and-purge eating pattern (the video clip “Bulimia Nervosa” describes one case). The bulimic goes on an eating binge and then purges by self-induced vomiting or use of a laxative. As with anorexics, most bulimics are preoccupied with food, have a strong fear of becoming overweight, and are depressed or anxious (Byrne & McLean, 2002; Cooley & Toray, 2001; Speranza & others, 2003). Unlike anorexia nervosa, the binge-and-purge pattern in bulimia nervosa occurs within a normal weight range, which means that it is often difficult to detect (Mizes & Miller, 2000).

Bulimia nervosa typically begins in late adolescence or early adulthood (Levine, 2002). About 90 percent of the cases are females. Approximately 1 to 2 percent of females are estimated to develop bulimia nervosa (Gotesdam & Agras, 1995). Many females who develop bulimia nervosa 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). Chapter 15 further explores eating patterns and proper nutrition.

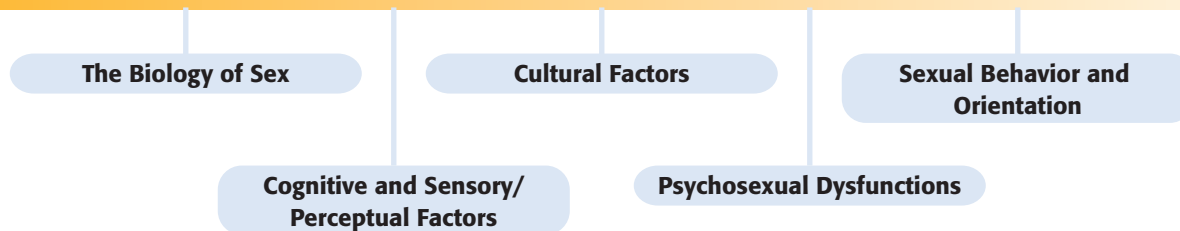
Review and Sharpen Your Thinking

2 Explain the physiological basis of hunger and the nature of eating behavior.

- 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



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

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.

The Biology of Sex

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

The Hypothalamus, Cerebral Cortex, and Limbic System 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 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 object (Cheasty, Condren, & Cooney, 2002). Temporal lobe damage in male cats has been shown to impair the animals' 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 (Mendez & others, 2000).

The brain tissues that produce sexual feelings and behaviors are activated by various neurotransmitters in conjunction with various sex hormones. Sexual motivation also is characterized by a basic urge-reward-relief neural circuit. The motivation for sex is generated by excitatory neurotransmitters. 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. The two main classes of sex hormones are estrogens and androgens. **Estrogens**, the class of sex hormones that predominate in females, are produced mainly by the ovaries. **Androgens**, the class of sex hormones that predominate 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, regulated by the hypothalamus, monitors hormone levels. The pituitary gland signals the testes or ovaries to manufacture the hormone. Then the pituitary gland, through interaction with the hypothalamus, detects the point at which an optimal hormone level is reached and stops production of the hormone.

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; Thiessen, 2002). Nonetheless, sexual behavior is so individualized in humans that it is difficult to specify the effects of hormones (Susman & Rogol, 2004).

The 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—excitement, plateau, orgasm, and resolution—as identified by Masters and Johnson (see figure 11.7).

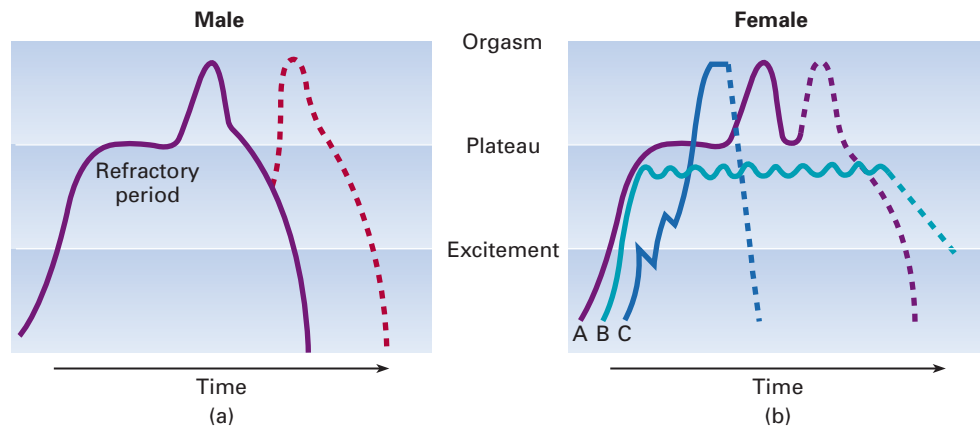
estrogens The class of sex hormones that predominate in females.

androgens The class of sex hormones that predominate in males.

human sexual response pattern Identified by Masters and Johnson; consists of four phases—excitement, plateau, orgasm, and resolution.

FIGURE 11.7 Male and Female Sexual Response Patterns Identified by Masters and Johnson

(a) The excitement, plateau, orgasm, and resolution phases of the human male sexual response pattern. Notice that males enter a refractory period, which lasts from several minutes up to a day, in which they cannot have another orgasm. (b) The excitement, plateau, orgasm, and resolution phases of the human female sexual response pattern. 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 orgasm (the second peak in pattern A) 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.



The *excitement phase* begins erotic responsiveness; it 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 phase. The most obvious signs of response in this phase are lubrication of the vagina and partial erection of the penis.

The second phase of the human sexual response, called the *plateau phase*, is a 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.

The third phase of the human sexual response cycle is *orgasm*. How long does orgasm last? Some individuals sense that time is standing still when it takes place, but orgasm lasts for only about 3 to 15 seconds. Orgasm involves an explosive discharge of neuromuscular tension and an intense pleasurable feeling. However, orgasms are not all alike. For example, females show three different patterns in the orgasm phase: multiple orgasms; no orgasm; and excitement rapidly leading to orgasm, bypassing the plateau phase (this pattern most clearly corresponds to the male pattern in intensity and resolution; see figure 11.7).

Following orgasm, the individual enters the *resolution phase*, in which blood vessels return 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 anywhere from several minutes to a day, in which they cannot have another orgasm. The length of the refractory period increases as men age.

Cognitive and Sensory/Perceptual Factors

From experience, we know that our cognitive world plays an important role in our sexuality (Crooks & Bauer, 2002). 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 generating erotic images and even reach orgasm while they are having 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 9 that *scripts* are schemas for events). We carry these scripts with us in our memories. Two well-known sexual scripts are the traditional religious script and the romantic script. 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 are more likely 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; and women 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 the following: 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.

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).

Men and women differ in how much touch and visual stimulation motivate them sexually. 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). Women are more aroused by tender, loving touches that are coupled with verbal expressions of love than men are. Moreover, men are likely to become sexually aroused quickly, whereas women's sexual arousal tends to build gradually.

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, 2000). 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. It was designed to lure human males, just as pheromones attract male guinea pigs and cats. 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 their 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 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.

Cultural Factors

Sexual motivation also is influenced by cultural factors (McAnulty & Burnette, 2004; Tolman & Diamond, 2003). The range of sexual values across cultures is substantial. 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

pheromones Odorous substances, released by animals, that are powerful attractants.



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.

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 Manganian 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, the 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, Manganians have sex pretty much every day. Manganian women report a high frequency of orgasm.

Psychosexual Dysfunctions



In-Psych Plus

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 inability to achieve it (Kelly, 2004).

In disorders associated with the desire phase, 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 nothing short of 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).

Attempts to treat psychosexual dysfunctions through traditional forms of psychotherapy, as if the dysfunctions were personality disorders, have not been very successful; however, 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 in helping males with sexual dysfunction 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 includes headaches in 1 of 10 men, seeing blue (because the eyes contain an enzyme similar to the one on which Viagra works in the penis, about 3 percent of users develop temporary vision problems ranging from blurred vision to a blue or green halo effect), and blackouts (Viagra can trigger 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.

Sexual Behavior and Orientation

Earlier we contrasted the sexual values and behaviors of two remote cultures—Ines Beag and Mangaia. Few cultures are as isolated and homogeneous as these two. In the United States, sexual behaviors and attitudes reflect its diverse, multicultural population, placing Americans somewhere in the middle of a continuum going from repressive to liberal. We are more conservative in our sexual habits than once thought but somewhat more open-minded regarding sexual orientation than a century ago.

Sexual Attitudes and Practices Describing sexual practices in America has always been challenging (Dunne, 2002; Wiederman & Whitley, 2002). In 1948, Alfred Kinsey and his colleagues shocked the nation by reporting that his survey of American's sexual practices 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 the trend toward permissive sexuality (for example, a *Playboy* magazine poll of its readers) (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

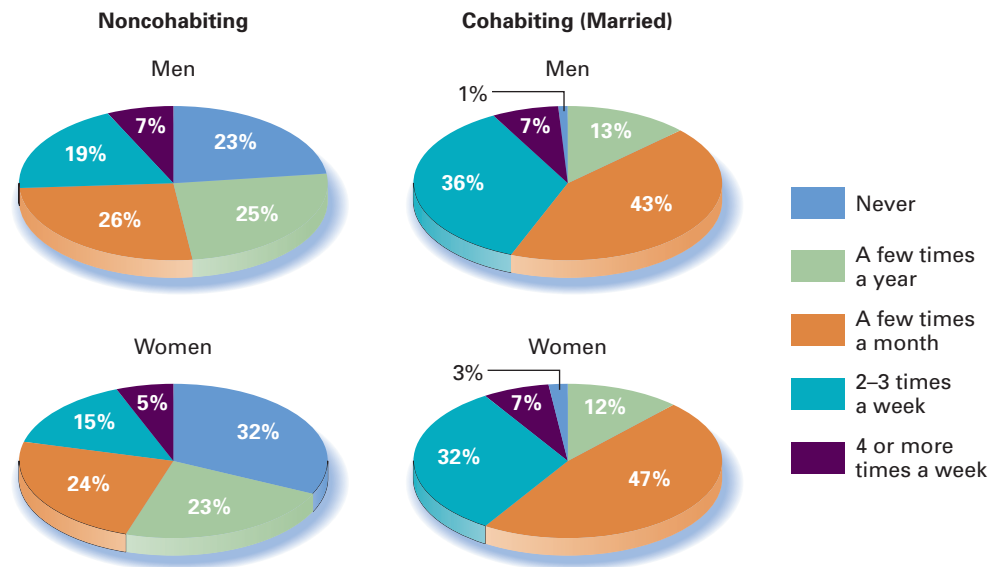


FIGURE 11.8 The 1994 *Sex in America* Survey Percentages show noncohabiting and cohabiting (married) males' and females' responses to the question "How often have you had sex in the past year?"

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 that were based on unrepresentative groups of volunteers. Here 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 11.8 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.
- 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.

In sum, 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.

I 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

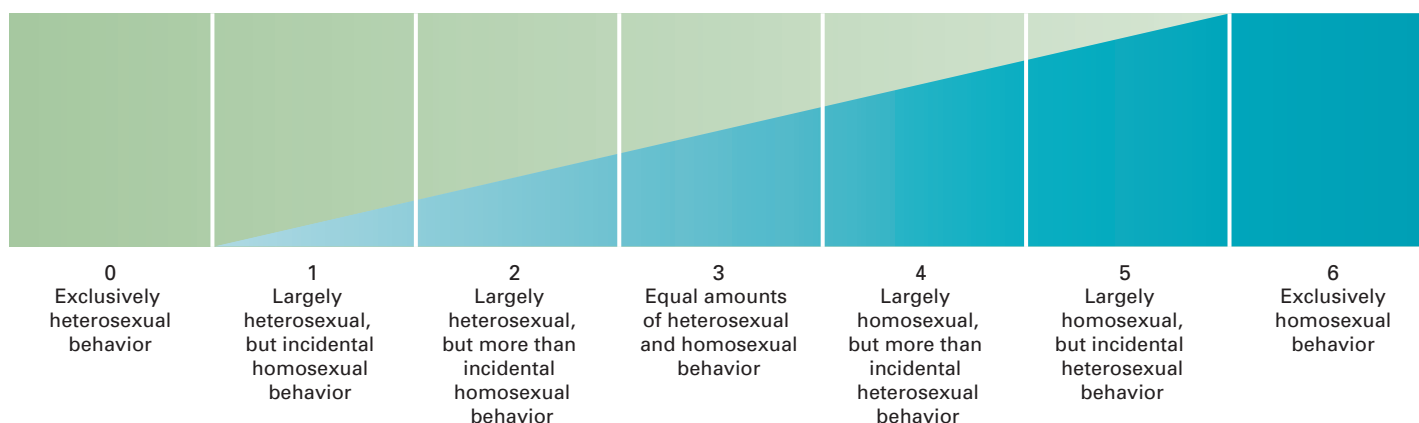


FIGURE 11.9 The Continuum of Sexual Orientation The continuum ranges from exclusive heterosexuality, which Kinsey and associates (1948) labeled 0, to exclusive homosexuality, 6. People who are about equally attracted to both sexes, 2 to 4, are bisexual.

fantasies, and rate the strength of their own sex drive higher than women do. 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. These myths include the belief 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 about, doubts about, or problems in sex is virtually a crime.

Too often, people think of sex as a performance skill, such as 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, although 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 individuals experience some periods of vulnerability and confusion along the way (McAnulty & Burnette, 2004). (The video clip “Changing Genders” presents the example of Angela, who has chosen to undergo sex reassignment surgery.) Many individuals wonder and worry about their sexual attractiveness and their ability to satisfy their sexual partner. Often our worries about sexuality are fueled by media stereotypes about sexual potency and sexual exploits.

Sexual Orientation 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, from exclusive heterosexuality to exclusive homosexuality, rather than as an either/or proposition (Kelly, 2004). Kinsey, Pomeroy, and Martin (1948) described this continuum on a scale ranging from 0 (exclusive heterosexuality) to 6 (signifying exclusive homosexuality) (see figure 11.9). Also, some individuals are *bisexual*, being sexually attracted to people of both sexes. 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



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An individual's sexual preference is most likely determined by a combination of genetic, hormonal, cognitive, and environmental factors.



heterosexuals have similar physiological responses during sexual arousal and seem to be aroused by the same types of tactile stimulation. Investigators find no differences between homosexuals and heterosexuals in a wide range of attitudes, behaviors, and adjustments (Bell, Weinberg, & Mammersmith, 1981). 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. 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 (Savin-Williams & Diamond, 2004). Like heterosexual women (Peplau, 2002, 2003),

- 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 motivations for sexual behavior.

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

A substance called "Spanish fly" has been promoted as a powerful aphrodisiac. As mentioned, it is not an effective sexual stimulant and can cause severe side effects. Could the placebo effect (discussed in chapter 2) explain people's faith in this and other aphrodisiacs? How?

SOCIAL COGNITIVE MOTIVES 4

Achievement

Affiliation

Well-Being

What are some important social cognitive motives and how do they influence behavior?

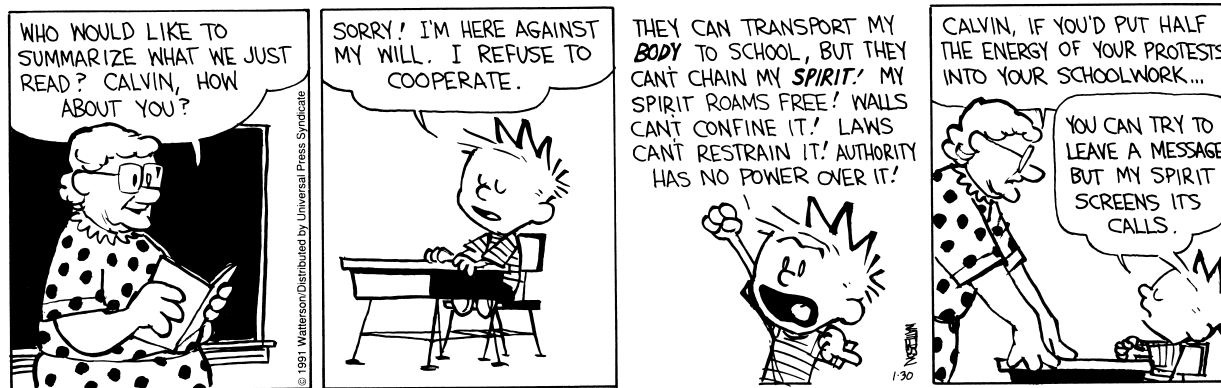
The previous discussions of hunger and sexual motivation focused to a large degree on physiological factors and on the involvement of the hypothalamus and other brain structures. Although there is a significant cognitive component to sexual behavior, it does not always predominate. This section presents three motives that have strong social cognitive foundations: achievement, affiliation, and well-being.

Achievement

Some people are highly motivated to succeed and spend considerable effort striving to excel—such as Lance Armstrong, whose remarkable recovery from cancer was capped by winning the Tour de France, the world's premier bicycle race. But individuals differ in their achievement motivation. Others are not as motivated to succeed and don't work as hard to achieve.

Calvin and Hobbes

by Bill Watterson



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Need for Achievement Need for achievement is the desire to accomplish something, to reach a standard of excellence, and to expend effort to excel. (To explore your level of need for achievement, play a ring toss game in the interactivity “Need for Achievement.”) Borrowing from Henry Murray’s (1938) theory and measurement of personality, psychologist David McClelland (1955) assessed achievement by showing individuals ambiguous pictures that were likely to stimulate achievement-related responses. The individuals were asked to tell stories about the pictures, and their comments were scored according to how strongly they reflected achievement. Researchers have found that individuals whose stories reflect high achievement motivation have a stronger hope for success than fear of failure, are moderate rather than high or low risk takers, and persist with effort when tasks become difficult (Atkinson & Raynor, 1974).

McClelland (1978) also wondered if achievement behavior could be increased by increasing achievement motivation. 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 businessmen that McClelland trained started more new businesses and employed more new people in the 2 years after the training.

Cognitive Factors You might recall from chapter 1 that Albert Bandura (1997, 2000, 2001) believes that cognitive factors are an important aspect of understanding behavior. Earlier in this chapter, I highlighted a key cognitive factor in motivation: intrinsic motivation, which is based on such internal factors as self-determination, curiosity, challenge, and effort. In contrast, extrinsic motivation, involves external incentives, such as rewards and punishments. The following section on attribution shows that intrinsic and extrinsic motivation are often one set of causes that individuals look at as they attempt to explain their behavior.

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

attribution theory States 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 underlying causes of behavior in an effort to make sense out of the behavior. In a way, say attribution theorists, people are like intuitive scientists, seeking the cause behind what happens. (Attribution is also discussed in chapter 16.)

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, which are environmental, situational factors, such as rewards or task difficulty (Heider, 1958). If college students do not do well on a test, do they attribute it 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 amenable to change. 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).

Goal Setting, Planning, and Monitoring In the discussion of cognitive factors earlier in the chapter, the importance of self-generated goals was emphasized. Goal setting, planning, and self-monitoring are critical aspects of achievement (Pintrich, 2003; Pintrich & Schunk, 2002; Zimmerman & Schunk, 2004). Goals help individuals to reach their dreams, increase their self-discipline, and maintain interest. Goal setting and planning often work in concert.

Researchers have found that individuals' achievement improves when they set goals that are specific, short term, and challenging (Bandura, 1997; Schunk, 2004). A fuzzy, 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." You can set both long-term (distal) and short-term (proximal) goals. 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, such as "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." David McNally (1990), author of *Even Eagles Need a Push*, advises that, when individuals set goals and plan how to reach them, they should remind themselves to live their lives one day at a time. Make commitments in bite-size chunks. A house is built one brick at a time; an artist paints one stroke at a time. You also should work in small increments.

Another good strategy is to set challenging goals. A challenging goal is a commitment to self-improvement. Strong interest and involvement in activities are sparked by challenges. Goals that are easy to reach generate little interest or effort. However, unrealistically high goals can bring failure and diminish self-confidence.

Achievement motivation researcher John Nicholls and his colleagues (Nicholls, 1979; Nicholls & others, 1990) distinguish among ego-involved goals, task-involved goals, and work-avoidant goals. Individuals with ego-involved goals strive to maximize favorable evaluations and minimize unfavorable ones. Thus ego-involved individuals focus on how smart they will look and on their ability to outperform others. In contrast, individuals with task-involved goals focus more on mastering tasks. They concentrate on how well they can do the task and what they can learn. Individuals with work-avoidant goals try to exert as little effort as possible on a task. A good achievement strategy is to develop task-involved mastery goals rather than ego-involved or work-avoidant goals.

Planning how to reach a goal and monitoring progress toward the goal are critical aspects of achievement (Eccles, Wigfield, & Schiefele, 1998). Researchers have found that high-achieving individuals monitor their own learning and systematically evaluate their progress toward their goals more than low-achieving individuals do (Schunk, 2004; Schunk & Zimmerman, 2003; Zimmerman, 2001). To evaluate how goal-directed you are, see the Psychology and Life box.

How Goal-Directed Are You?

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

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

If most of these descriptions 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 addition to cognitive factors such as attribution, intrinsic motivation, and self-generation of goals, our sociocultural contexts contribute to our motivation to achieve (Eccles, 2004; Wigfield & Eccles, 2002). This section 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 People in the United States tend to be more achievement-oriented than people in many other countries. One study of 104 societies revealed that 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 the parents in industrialized countries (Barry, Child, & Bacon, 1959). In comparisons of Anglo-American children with Mexican and Latino children, the Anglo-American children were more competitive and less cooperative. For example, one study found that Anglo-American children were likelier to keep other children from achieving a goal when they could not achieve the goal themselves (Kagan & Madsen, 1972). Another study showed that Mexican children were more family-oriented than Anglo-American children, who tended to be more concerned about themselves (Holtzmann, 1982).

Another series of studies focused on the poor performance of American students on tests of mathematics and science in comparison to students in other countries. In one such study, American eighth- and twelfth-grade students were below the overall national average of 20 countries in math problem solving, geometry, algebra, and calculus (McKnight & others, 1987). In the eighth grade, Japanese students had the highest average scores and in the twelfth grade, Chinese students in Hong Kong had the highest scores. In a comparison that focused on 9- and 13-year-olds in 16 countries, Korean and Taiwanese students placed first and second in math achievement (Educational Testing Service, 1992). In this study, U.S. students finished 15th in math and 13th in science (out of 15 countries studied). In more recent cross-cultural comparisons, U.S. students fared a little better, falling in the average range of eighth-grade students in math and science from 45 countries (Atkin & Black, 1997). In this study, Korean, Singapore, and Japanese students scored the highest.

Harold Stevenson and his colleagues (1992, 1997, 2000) 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.

Differences in Asian and American parents were also found. 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 was due to innate ability, whereas Asian parents were likelier to say that their children’s math achievement was the consequence of effort and training (see figure 11.10). Asian students were likelier than American students to do math homework, and Asian parents were far likelier to help their children with their math homework than American parents were (Chen & Stevenson, 1989).

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,

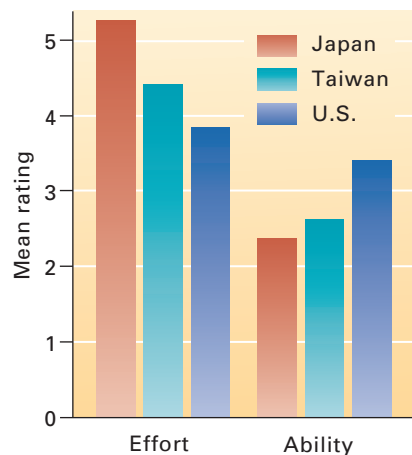


FIGURE 11.10 Mothers’ Beliefs About the Factors Responsible for Children’s Math Achievement in Three Countries

In one study, mothers in Japan and Taiwan were likelier to believe that their children’s math achievement was due to effort rather than to innate ability, whereas U.S. mothers were likelier to believe their children’s math achievement was due to innate ability (Stevenson, Lee, & Stigler, 1986).



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

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 likelier to emphasize math thinking, whereas American and German teachers were likelier to stress math skills (solving a specific problem or using a specific formula). Also noticeable was how much emphasis there is 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. The more time students spend learning, the likelier 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 do not take 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



UCLA psychologist Sandra Graham talking with a group of young boys about motivation. Dr. Graham has conducted research showing that middle-class African American children—like their White counterparts—have high achievement expectations and attribute their failures to lack of effort, rather than to lack of luck.

middle-SES African American children do not fit the stereotypes of either deviant or special populations. They, 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 luck.

Achievement Applications Findings about achievement can be applied to many different aspects of life. On a personal level, attribution, intrinsic motivation, goal setting, planning, and monitoring can be used to reach educational, career, and financial goals, even to find fulfillment. In the workplace, managers apply techniques based on achievement research to motivate employees.

The Workplace Work is what most of us will do at least half of our waking hours for more than 40 years of our lives. *Industrial/organizational (I/O) psychology* is the branch of psychology that focuses on the workplace—both the workers and the organization that employs them—to make work more enjoyable and productive.

The workplace is characterized by both intrinsic and extrinsic motivation. An important I/O task is to select employees who will be intrinsically motivated to do the job required. Another important task is to figure out how to extrinsically motivate employees to do their best work possible. Among possible reinforcements or incentives are bonuses, awards, time off, promotions, and praise. For example, an I/O psychologist might recommend that the company initiate an “Employee of the Month” program.

Good leaders know how to motivate employees. The contemporary view of effective leadership in the workplace involves creating a vision for others to follow, establishing values and ethics, and transforming the way an organization does business to improve its effectiveness and efficiency (Nickels, McHugh, & McHugh, 2002).

The workplace is changing from a context in which a few people dictate what others do to a context in which all employees work together to reach common goals. Participating in an organization’s decision making gives employees a sense of intrinsic motivation and self-determination that is lacking when they are simply told what to do by superiors.

Goal setting, planning, and monitoring are seen as important aspects of motivation in the workplace (Ilgen, 2000). I/O psychologists advise companies to guide employees in setting goals, planning how to achieve them, and monitoring their progress toward goals (DuBrin, 2004).

I/O psychologists attempt to influence the motivation of employees through *job design*. In this case, the goal is to design jobs so that employees will believe that their needs are met in a way that also meets the organization’s goals. Recent emphasis in job design has focused on modifying jobs so that they will allow employees to have more control, autonomy, feedback, and opportunity for involvement in their work (Ilgen, 2001).

Another aspect of motivation that interests I/O psychologists is whether workers are more productive and happier when they work individually or in groups (Riggio, 2003). Historically, Americans have worked individually. Employees in many Eastern countries, such as China, Japan, and Korea, have traditionally worked as teams. In recent years, many American companies have increasingly emphasized working in teams and groups.

Sports Athletes tend to be achievement-oriented individuals, at least in their sports domain. Some athletes turn to sport psychologists for help in achieving their full potential. For example, in his amazing rise to the world’s best golfer, Tiger Woods benefited from the advice of a team of advisors and coaches, including sport psychologist Jay Brunza. *Sport psychology* is a relatively new field that applies psychological principles to improving sports performance and the enjoyment of sports.

Many sport psychology techniques come from the cognitive and behavioral perspectives. Five techniques that many sport psychologists use to improve the motivation and performance of athletes are

- *Emphasize the process rather than the outcome.* Legendary Green Bay Packers football coach Vince Lombardi once said, “Winning isn’t everything; it is the only thing.” Today, however, sport psychologists advise against this type of thinking because it can actually take the athlete’s focus away from immediate performance. Sport psychologists encourage athletes to immerse themselves in what they are doing and not worry about the outcome. Focusing on the achievement process and the task at hand has been described as *mastery motivation*, in contrast with focusing on achievement outcome and winning, described as *performance motivation* (Henderson & Dweck, 1990; Treasure & Roberts, 2001).
- *Use cognitive restructuring and positive self-talk.* Often athletes in a slump think and say negative things about themselves. A sport psychologist might get them to cognitively restructure their thoughts and words more positively. For example, if a baseball player has been in a hitting slump for 3 weeks, a sport psychologist would encourage the player to think more about his overall successful batting average for the entire year to help rebuild his confidence.
- *Overcome adversity.* Adverse, difficult circumstances crop up for athletes, not just in sports but in life as well. Consider Lance Armstrong’s tremendous struggle with life-threatening cancer. His ability to cope and overcome this adversity strengthened his motivation. Former Wimbledon tennis champion Chuck McKinley said on a number of occasions, “In becoming a champion, you learn a lot more from your losses than from your wins.” Setbacks become an opportunity for learning, opening the way for growth and improvement.
- *Use deep breathing and muscle relaxation.* Some athletes get nervous as the competition is about to begin. Deep breathing and muscle relaxation can help them calm down and concentrate better. Deep breathing and muscle relaxation are discussed further in chapter 15.
- *Use visualization.* In visualization, athletes imagine how they will perform. The sport psychologist might work with a golfer to visualize the golf ball going in the hole after it is putted or with a tennis player to visualize clean, fluid strokes. Sport psychologists sometime review video clips of the athlete’s performance, select the best performance, and have the athlete watch those clips as part of developing positive imagery. Psychologist Richard Suinn caught the interest of athletes when he worked with the U.S. Olympic ski team. He divided the team into two groups of equally matched ability, one group using visual imagery, the other group not using it. The group using visual imagery improved so much that the coach called off the experiment and insisted that all the skiers use visual imagery (Suinn, 1976). In the 2000 Olympics, more than 20 sport psychologists worked with U.S. athletes and coaches.

Achievement is an important social cognitive motive. But people not only have varying degrees of need for achievement; they also vary in the extent to which they are motivated to be with other people.

Affiliation

Are you the kind of person who likes to be around people a lot? Or would you rather stay home and read a book? The **need for affiliation** is the motive to be with other people. This involves establishing, maintaining, and restoring warm, close, personal relationships. Our need for affiliation is reflected in the importance of parents’ nurturance in children’s development, the intimate moments of sharing private thoughts in friendship, the uncomfortable feelings we have when we are lonely, and the powerful attraction we have for someone else when we are in love.

need for affiliation The motive to be with other people.

Although each of us has a need for affiliation or relatedness, some people have a stronger need than others. Some of us are motivated to be surrounded by lots of friends and feel as if something is drastically missing if we are not in love with someone and they with us. Others don't have such a strong need for relatedness. They don't fall apart if they don't have friends around them all of the time, and don't sit around all day in an anxious state because they don't have someone in love with them.

Cultures vary in how strongly they promote the need for relatedness. Many Western cultures—such as the United States, Canada, and Western European countries—emphasize individual achievement, independence, and self-reliance. Many Eastern cultures—such as China, Japan, and Korea—emphasize affiliation, cooperation, and interdependence (Triandis, 2000).



Do we really need to connect with others? See the video clip “Ostracism” to learn what happens when the need for affiliation is not satisfied. Affiliation and relatedness are believed to be an important dimension of well-being.

Well-Being

Are you motivated to live the good life? What constitutes well-being? Would your list of items for living the good life and well-being include happiness? Being able to spend time with the people you love? And what about intelligence and wisdom? Some people value happiness more than intelligence and wisdom; others value intelligence and wisdom more than happiness (King & Pennebaker, 1998).

Well-being is subjective. Indeed, when researchers study well-being, they often refer to it as *subjective well-being*. Richard Ryan and Edward Deci (2000) recently proposed that three factors need to be present for well-being:

- *Competence*. This sense of mastery entails the motivation to do whatever you attempt well. It involves using your intelligence and skills effectively.
- *Autonomy*. This consists of doing things independently. It involves intrinsic motivation, self-initiation, and self-determination.
- *Affiliation*. As we have seen, affiliation has to do with the need to be with other people.

In Ryan and Deci's view, when the needs for competence, autonomy, and affiliation are satisfied, the result is enhanced well-being. When these needs are thwarted, the result is diminished well-being. They believe that excessive control by others, non-optimal challenges, and lack of connectedness result in a lack of initiative and responsibility and, in some cases, produce distress and psychological problems.

Some critics argue, though, that you can have too much autonomy (Schwartz, 2000). In this view, autonomy, freedom, and self-determination can become excessive, and when that happens people have an imbalance in their lives that may undermine their competence and affiliation. Thus living the good life and attaining well-being may involve a balance of the three components of competence, autonomy, and affiliation.

As was mentioned previously, cultures often vary in the extent to which they emphasize autonomy or affiliation. Thus what individuals believe constitutes the good life and well-being in some cultures might include a stronger emphasis on autonomy (for example, the United States), in others a stronger emphasis on affiliation (for example, Japan).

Carol Ryff and Burton Singer (1998) have conducted research on well-being for a number of decades. Based on their research, they concluded that living the good life and experiencing well-being involve both positive physical health and positive psychological health. Furthermore, they argued that positive psychological health is most likely to be achieved by leading a life of purpose (a sense of doing something meaningful), having quality connections with others (affiliation and relatedness), having positive self-regard (self-esteem), and having mastery (a sense of competence and doing things effectively).

Let's examine Lance Armstrong's well-being and see how these dimensions are involved:

- *Physical well-being.* Lance was a great athlete before his cancer. However, the cancer threatened his physical well-being. Rather than dwelling on this major physical setback, he turned the situation into a positive life experience by challenging himself to become physically stronger than he was before the cancer and to focus on his psychological well-being as well.
- *Psychological well-being.* Lance is extremely competent in his profession—indeed, the very best in the world. Becoming a great cyclist required considerable autonomy, self-determination, and intrinsic motivation. He may have focused too much on developing those attributes, though. During his bout with cancer, he realized that his psychological well-being required more than autonomy. He recognized that he needed to develop better relationships with others. This change in motivation resulted in his marriage and the birth of a son, which he says has greatly increased his happiness.

Review and Sharpen Your Thinking

4 Characterize the social cognitive motives and how they influence behavior.

- Discuss the need for achievement and the factors that motivate people to excel.
- Describe the concept of affiliation.
- Identify the components of well-being.

Make a list of five factors that you believe are the most important aspects of your well-being. How well do they match up with the factors discussed in the chapter?

EMOTION 5

The Biology of Emotion

Behavioral Factors

Classifying Emotions

Cognitive Factors

Sociocultural Factors

What are some views of emotion?

As Lance Armstrong rode onto the Champs-Élysées at the end of the Tour de France, he felt a swell of emotion. He was about to win cycling's most storied race. With joy etched across his face, in front of thousands of happy fans, Lance was awarded the Tour de France trophy. His third trophy was no less thrilling than his first.

As was mentioned at the beginning of the chapter, motivation and emotion are closely linked. Think about sex, which often is associated with joy; about aggression, which usually is associated with anger; and about achievement, which is associated with pride, joy, and anxiety. The terms *motivation* and *emotion* both come from the Latin word *movere*, which means "to move." Both motivation and emotion spur us into action.

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—and be fairly happy to ecstatic—or angry—and be annoyed to fuming.

FIGURE 11.11 The Autonomic Nervous System and Its Role in Arousing and Calming the Body

Sympathetic Nervous System		Parasympathetic Nervous System
Increases	Blood flow to brain	Decreases
Dilate	Pupils of eyes	Constrict
Faster	Breathing rate	Slower
Faster	Heartbeat	Slower
Increases	Skin perspiration	Decreases
Decreases	Digestive activity	Increases
Increases; stress hormones released	Adrenal gland activity	Decreases; stress hormones inhibited

Defining emotion is difficult because it is not easy to tell when a person is in an emotional state. Are you in an emotional state when your heart beats fast, your palms sweat, and your stomach churns? Or are you in an emotional state when you think about how much you are in love with someone? Or when you smile or grimace? The body, the mind, and the face 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 (Davidson, Scherer, & Goldsmith, 2002). 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).

The 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 you moved through the emotions of fear, joy, and anger, your body changed.

Arousal Recall from chapter 3 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 11.11). The *sympathetic nervous system (SNS)* is involved in the body’s arousal; it is responsible for a rapid reaction to a stressor, sometimes is 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

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

groups. All of these changes prepare us for action. At the same time, the body stops digesting food, because it is not necessary for immediate action (which could explain why just before an exam, students usually are not hungry).

The *parasympathetic nervous system (PNS)* calms the body. Whereas the sympathetic nervous system prepares the individual for fighting or running away, the parasympathetic nervous system 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 such as anger are associated with elevated SNS activity as exemplified in heightened blood pressure and heart rate. But states of happiness and contentment also activate the SNS to a lesser extent.

Measuring Arousal 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)*, which involves 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—heart rate, breathing, and electrodermal response (an index detecting skin resistance to passage of a weak electric current)—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 electrodermal responses increase substantially when the key questions are asked, the individual is assumed to be lying. (Lying has also been linked with certain emotional facial expressions, as you can see in the video clip "Detecting Deception.")

How accurate is the lie detector? Although it measures the degree of arousal to a series of questions, no one has found a unique physiological response to deception (Lykken, 1987, 2001). Heart rate and breathing can increase for reasons other than lying, making it difficult to interpret the physiological indicators of arousal.

Accurately identifying truth or deception is linked with the skill of the examiner and the skill of the individual being examined. Body movements and the presence of certain drugs in the person's system can interfere with the polygraph's accuracy. Sometimes the mere presence of the polygraph and the individual's belief that it is accurate in detecting deception trigger a confession of guilt. Police may use the polygraph in this way to get a suspect to confess. However, in too many instances it has been misused and misrepresented. Experts argue that the polygraph errs just under 50 percent of the time, especially as 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 (Malakoff, 2003). However, 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 inability to tell who is lying and who is not (Greenberg, 2002; Saxe, 1988).

James-Lange and Cannon-Bard Theories 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? Two well-known theories of emotion that involve physiological processes provide answers to this question.

Common sense tells you that you are trembling and running away from the bull because you are afraid. But William James (1890/1950) and Carl Lange (1922) said emotion works in the opposite way. The **James-Lange theory** states that emotion results from physiological states triggered by stimuli in the environment: Emotion occurs *after* physiological reactions. Moreover, each emotion, from anger to rapture,



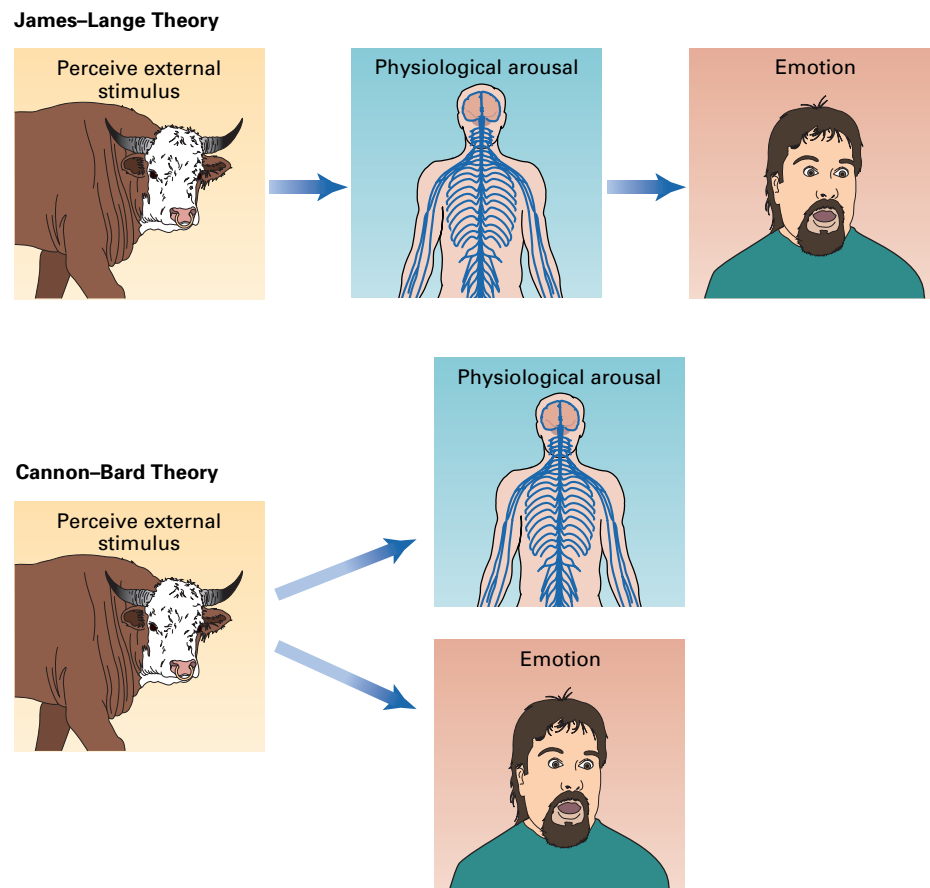
Examiners use a polygraph to tell if someone is lying. A polygraph monitors changes in the body believed to be influenced by emotional states. Controversy has swirled about the polygraph's use because it is unreliable.



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

James-Lange theory States that emotion results from physiological states triggered by stimuli in the environment.

FIGURE 11.12 James-Lange and Cannon-Bard Theories

has a distinct set of physiological changes, evident in changes in heart rate, breathing patterns, sweating, and other responses. Essentially, the James-Lange theory proposes that, after the initial perception, the experience of the emotion results from the perception of one's own physiological changes.

Let's see how the James-Lange theory would explain fear in the situation with the bull. 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. In other words, you perceive a stimulus in the environment, your body responds, and you interpret the body's reaction as emotion. In one of James' own examples, you perceive you have lost your fortune, you cry, and then interpret the crying as feeling sad. This goes against the commonsense sequence of losing your fortune, feeling sorry, and then crying.

Walter Cannon (1927) objected to the assumption in the James-Lange theory that each emotional experience has its own particular set of physiological changes. He argued that different emotions could not be associated with specific physiological changes because autonomic nervous system responses are too diffuse and slow to account for rapid and differentiated emotional responses.

To understand Cannon's view, imagine the bull and the picnic once again. Seeing the bull scratching its hoof causes the thalamus of your brain to do two things simultaneously: First, it stimulates your autonomic nervous system to produce the physiological changes involved in emotion (increased heart rate, rapid breathing); second, it sends messages to your cerebral cortex, where the experience of emotion is perceived. Philip Bard (1934) supported this theory, and so the theory became known as the **Cannon-Bard theory**, the theory that emotion and physiological reactions occur simultaneously. In the Cannon-Bard theory, the body plays a less important role than in the James-Lange theory. Figure 11.12 shows how the James-Lange and Cannon-Bard theories differ.

Cannon-Bard theory States that emotion and physiological states occur simultaneously.

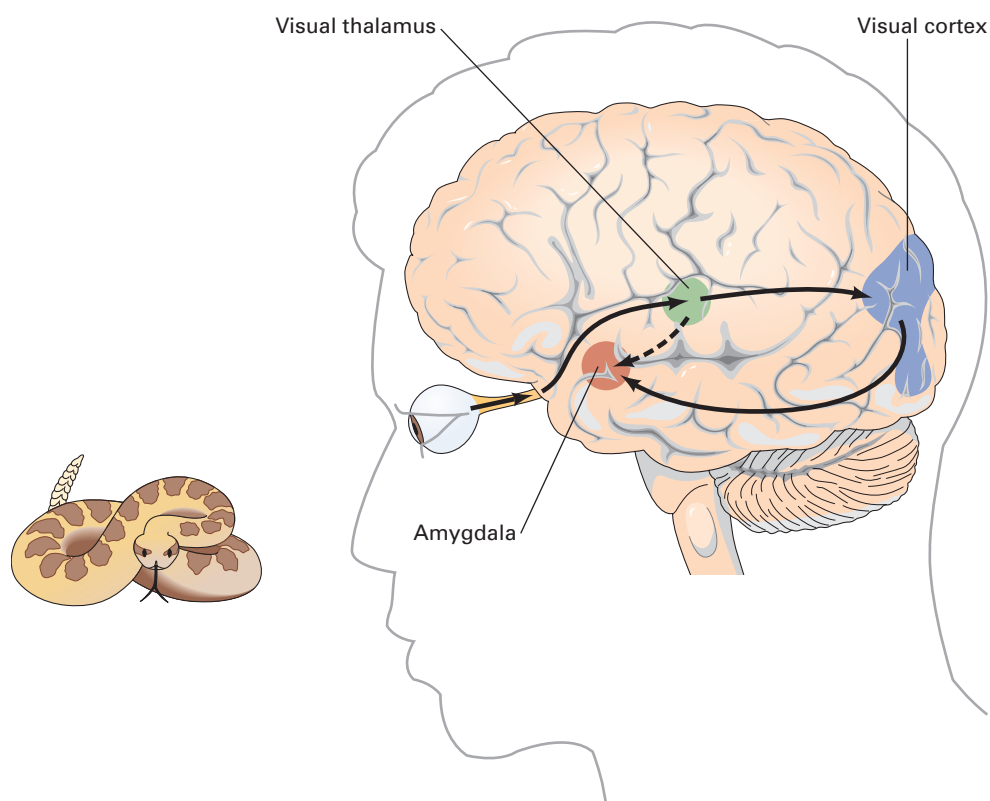


FIGURE 11.13 Direct and Indirect Brain Pathways in the Emotion of Fear Information about fear can follow two pathways in the brain when an individual sees a snake. The direct pathway (*broken arrow*) conveys information rapidly from the thalamus to the amygdala. The indirect pathway (*solid arrows*) transmits information more slowly from the thalamus to the sensory cortex (here, the visual cortex), then to the amygdala.

The question of whether or not emotions involve discrete autonomic nervous system responses continues to be debated (Keltner & Ekman, 2000). Recent studies have documented some emotion-specific autonomic nervous system responses (Christie & Friedman, 2004; 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 more interested in charting the neural circuitry of emotions and discovering the role of neurotransmitters in emotion than was the case in the early twentieth century. The focus of much of their work has been on the amygdala, the almond-shaped structure in the limbic system, discussed in chapter 3. 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 research studies that focus on the neural circuitry of one emotion: fear. The amygdala plays a central role in 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 from harm. This fear system was designed by evolution to detect and respond to predators and other types of natural dangers that threaten survival or territory.

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 is activated and immediately sends out messages to bodily organs that respond in ways to prevent harm to the organism.

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 11.13). The direct pathway does not convey detailed information about the stimulus, but it has the advantage of speed. And speed clearly is an important characteristic of information

available to an organism facing a threat to its survival. The indirect pathway carries nerve impulses from the sensory organs (eye, ear, for example) to the thalamus (recall that the thalamus is a relay station for incoming sensory stimuli); from the thalamus, the nerve impulses travel to the sensory cortex, which then sends appropriate signals to the amygdala.

Recall from chapter 9 that the amygdala is 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 and anxieties around with them 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 fear is learned, it is so hard to erase.

LeDoux (2000, 2002) says that it is unlikely that the amygdala mediates all emotions. There is some evidence that the amygdala participates in positive emotions, but that role is not yet well understood (Lane & others, 1997; Park & others, 2001; Zalla & others, 2000).

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) have shown that the cerebral hemispheres work differently in approach- and withdrawal-related emotions. 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.)

Researchers are also intrigued by the roles that neurotransmitters play in the neural pathways of emotions. 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).



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Cognitive Factors

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). Thinking is said to be responsible for feelings of love and hate, joy and sadness. Cognitive theorists also recognize the role of the brain and body in emotion, but they give cognitive processes the main credit for emotion.

The Two-Factor Theory of Emotion In the **two-factor theory of emotion** developed by Stanley Schachter and Jerome Singer (1962), emotion is determined by two factors: physiological arousal and cognitive labeling (see figure 11.14). They argued that we look to the external world for an explanation of why we are aroused. We interpret external cues and label the emotion. 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 may label the feeling "guilty."

To test their theory of emotion, Schachter and Singer (1962) injected volunteer participants with epinephrine, a drug that produces high arousal. After participants were given the drug, they 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 behavior influenced the participants' cognitive interpretation of their own arousal. When they were with a happy person, they rated

two-factor theory of emotion

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

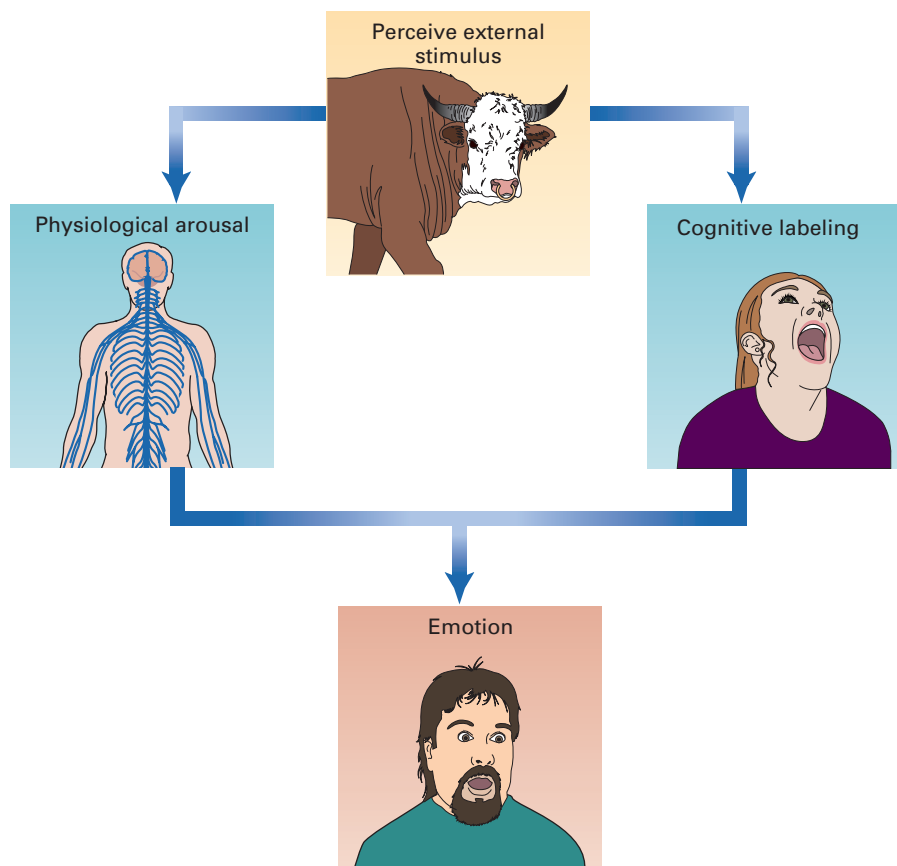


FIGURE 11.14 Schachter and Singer's Two-Factor Theory of Emotion

themselves as 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 the Schachter and Singer experiment, but in general research supports the belief that misinterpreted arousal intensifies emotional experiences (Leventhal & Tomarken, 1986). An intriguing study by Dutton and Aron (1974), substantiates this conclusion. In the study, an attractive woman approached men while they were walking across the Capilano River Bridge in British Columbia. Only those without a female companion were approached. 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 11.15). The female interviewer made the same request of other men crossing a much safer, lower bridge. The men on the Capilano River Bridge told more sexually oriented stories and rated the female interviewer more attractive than did men on the lower, less frightening bridge.

The Primacy Debate: Cognition or Emotion? Richard Lazarus (1991) believes cognitive activity is a precondition for emotion. He says that we cognitively appraise ourselves and our social circumstances. These appraisals, which include values, goals, commitments, beliefs, and expectations, determine our emotions. 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.

Robert Zajonc (1984) disagrees with Lazarus. Emotions are primary, he says, and our thoughts are a result of them. Who is right? Both likely are correct. Lazarus refers



FIGURE 11.15 Capilano River Bridge Experiment: Misinterpreted Arousal Intensifies Emotional Experiences

(Top) The precarious Capilano River Bridge in British Columbia. (Bottom) The experiment in progress. An attractive woman approached men while they were crossing the bridge; she 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 interpreted their arousal as sexual attraction for the female interviewer.

mainly to a cluster of related events that occur over a period of time, whereas Zajonc describes single events or a simple preference for one stimulus over another. Lazarus speaks about love over the course of months and years, a sense of value to the community, and plans for retirement; Zajonc talks about a car accident, an encounter with a snake, and a preference for ice cream rather than spinach. Some of our emotional reactions are virtually instantaneous and probably do not involve cognitive appraisal, such as shrieking on detecting a snake. Other emotional circumstances, especially those that occur over a long period of time, such as a depressed mood or anger toward a friend, are likelier to involve cognitive appraisal. Indeed, the direct and indirect brain pathways described earlier support the idea that some of our emotional reactions do not involve deliberate thinking, whereas others do (LeDoux, 2000, 2001).

Behavioral Factors

Remember that our definition of emotion includes not only physiological and cognitive components but also a behavioral component. The behavioral component can be verbal or nonverbal. Verbally, a person might show love for someone by professing it verbally or might display anger by saying some nasty things. Nonverbally, a person might smile, frown, show a fearful expression, look down, or slouch.

The most interest in the behavioral dimension of emotion has focused on the nonverbal behavior of facial expressions. 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 11.16, 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. In this view, 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 the facial feedback hypothesis comes from an experiment by Ekman and his colleagues (1983). In this study, 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 (you might want to try this out yourself). They were asked to hold their expression for 10 seconds, during which time the researchers measured their heart rate and body temperature. When they moved facial muscles in the ways described, they showed a rise in heart rate and a steady body temperature, physiological reactions that characterize 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 facial feedback hypothesis provides support for the James-Lange theory of emotion discussed earlier—namely, that emotional experiences can be generated by changes in and awareness of our own bodily states.

Sociocultural Factors

Are the facial expressions that are associated with different emotions largely innate, or do they vary across cultures? Are there gender variations in emotion?

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

Culture and the Expression of 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



FIGURE 11.16 Recognizing Emotions in Facial Expressions Look at the six photographs and determine the emotion reflected in each of the six faces. (*Top*) happiness, anger, sadness (*bottom*) surprise, disgust, fear

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 have 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 and his colleague photographed people expressing emotions such as happiness, fear, surprise, disgust, and grief. When they showed the photographs to people from the United States, Chile, Japan, Brazil, and Borneo (an Indonesian island in the western Pacific Ocean), 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. Ekman showed them photographs of American faces expressing emotions such as fear, happiness, anger, and surprise. Then he read stories about people in emotional situations. The Fore were able to match the descriptions of emotions with the facial expressions in the photographs. The similarity of facial expressions of emotions by persons in New Guinea and the United States is shown in figure 11.17. (To learn more about Ekman's research on universal expressions of emotions, listen to the audio clip "Evolutionary Psychology.")





FIGURE 11.17 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.

Whereas facial expressions of basic emotions appear to be universal, display rules for emotion vary. **Display rules** are sociocultural standards that determine when, where, and how emotions should be expressed. For example, although happiness is a universally expressed emotion, when, where, and how it is displayed may vary from one culture to another. The same is true for other emotions, such as fear, sadness, and anger. 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 express frustration but accept the snowstorm and build an igloo.

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.

Can you identify emotional tone? Go to the interactivity “Nonverbal Components of Speech” to explore the role of emotional tone in determining the meaning of verbal communication.

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 means either everything is okay or the desire to hitch a ride, is an insult in Greece, similar to a raised third finger in the United States. See the video clip “Cultural Variations in Nonverbal Behavior” for more information on cross-cultural research on nonverbal communication.

Gender Influences Unless you’ve been isolated on a mountaintop, you probably know the stereotype about gender and emotion: She is emotional; he is not. This stereotype is a powerful and pervasive image in our culture (Shields, 1991).

Is this stereotype supported by research on emotional experiences? Researchers have found that females and males are often more alike in the way they experience emotion than the stereotype would lead us to believe. 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. For many emotional experiences, researchers do not find differences between females and males—both sexes are equally likely to experience love, jealousy, 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 go beyond stereotype and consider some specific emotional experiences, contexts in which emotion is displayed, and certain beliefs about emotion, gender does matter in understanding emotion (Brannon, 1999; Shields, 1991).



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In the Middle Eastern country of Yemen, male-to-male kissing is commonplace, but in the United States it is uncommon.

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

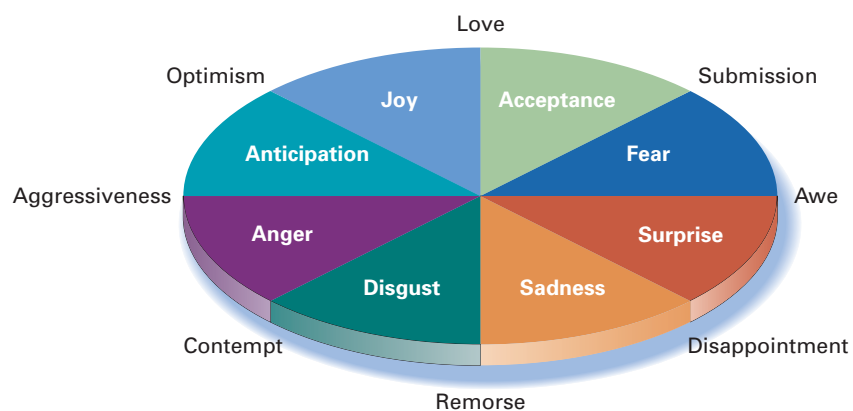


FIGURE 11.18 Plutchik's Classification of Emotions Plutchik theorized that people experience the eight basic emotions represented in the colored sections of the drawing, as well as combinations of these emotions, shown outside the wheel.

Consider anger. Men are more likely to show anger toward strangers, especially other men, when they feel they have been challenged, and men are more likely to turn their anger into aggressive action than women are.

Differences between females and males regarding emotion are more likely to occur in contexts that highlight social roles and 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.

Classifying Emotions

There are more than 200 words for emotions in the English language, indicating the complexity and variety of emotions. Not surprisingly, psychologists have created ways to classify emotions. One of these schemes is the wheel model. Another is a two-dimensional model.

The Wheel Model A number of psychologists have classified the emotions we experience by placing them on a wheel. One such model was proposed by Robert Plutchik (1980) (see figure 11.18). 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. Ecstasy and enthusiasm are positive emotions; grief and anger are negative emotions. For example, think about your ecstasy when you get an unexpected A on a test or your enthusiasm about the 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. Possibly some emotions are primary, and, if mixed together, they combine to form all other emotions. Happiness, disgust, surprise, sadness, anger, and fear are candidates for primary emotions. For example, combining sadness and surprise gives disappointment. Jealousy is composed of love and anger. Plutchik developed the emotion wheel to show how primary emotions work. Mixtures of primary emotions adjacent to each other produce other emotions. Some emotions are opposites—love and remorse, optimism and disappointment.

Another wheel-like model of emotion was proposed by Sylvan Tompkins (1962, 1981). He believes that the basic emotions are fear, anger, joy, distress, disgust, interest, surprise, contempt, and shame. Figure 11.19 shows that there is some consensus between Plutchik and Tompkins.

Plutchik	Tompkins
Fear	Fear
Anger	Anger
Joy	Joy
Sadness	Distress
Acceptance	Interest
Surprise	Surprise
Disgust	Contempt
Anticipation	Shame

FIGURE 11.19 Comparison of Plutchik's and Tompkins' Classifications of Basic Emotions

Theorists such as Plutchik and Tompkins view emotions as essentially innate reactions that require little cognitive interpretation. As such, their views reflect an evolutionary perspective on emotion. In this perspective, the basic emotions evolved and were retained because of their adaptive survival value.

The Two-Dimensional Approach The two-dimensional approach to classifying emotions argues that there are two broad dimensions of emotional experiences: positive affectivity and negative affectivity. *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, many of which are adaptive for the individual, its species, or both. Positive emotions can also broaden people's horizons and build their personal resources. For example, joy broadens by creating the urge to play, push the limits, and be creative. Interest broadens by creating the motivation to explore, absorb new information and experiences, and expand the self (Csikszentmihalyi, 1990; Ryan & Deci, 2000).

Negative emotions, such as fear, 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 (Basso & others, 1996). So to speak, negative emotions may cause a person to miss the forest (or a crime suspect's style of dress or gun) for the trees.

There is increasing interest in the role that positive affectivity might play in well-being. For example, positive emotions can serve as markers of well-being (Frederickson, 2001). When people's lives are characterized by joy, happiness, love, and interest, it is likely that these override negative emotions, such as sadness, anger, and despair (Diener, 1999).

Positive emotions can 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, 2000, 2002).

In some cases, positive emotions can undo lingering negative emotions (Frederickson, 2001). For example, 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.

A Negative Emotion: Anger Anger is a powerful emotion. It has strong effects not only on social relationships but also on the person experiencing the emotion. We can easily recount obvious examples of anger that causes such harm—unrestrained and recurrent violence toward others, verbal and physical abuse of children, perpetual bitterness, the tendency to carry a “chip on the shoulder” in which a person overinterprets others' actions as demeaning, and the inability to inhibit the expression of anger.

What makes people angry? People often get angry when they feel they are not being treated fairly or when their expectations are violated. One researcher asked people to remember or keep records of their anger experiences (Averill, 1983). Most of the people said they became at least mildly angry several times a week; some said they became mildly angry several times a day. In many instances, people said they got angry because they perceived that a friend or a loved one performed a misdeed. They especially got angry when they perceived the other person's behavior as unjustified, avoidable, and willful (Zillman, 1998).

Catharsis is the release of anger or aggressive energy by directly or vicariously engaging in anger or aggression; the *catharsis hypothesis* states that behaving angrily or watching others behave angrily reduces subsequent anger. Psychodynamic theory promotes catharsis as an important way to reduce anger, arguing that people have a natural, biological tendency to display anger. From this perspective, taking out your anger on a friend or a loved one should reduce your subsequent tendency to display anger; so should heavy doses of anger on television and the anger we see in professional sports and other aspects of our culture. Why? Such experiences release pent-up anger.

Social cognitive theory argues strongly against this view. This theory states that, by acting angrily, people often are rewarded for their anger and that, by watching others display anger, people learn how to be angry themselves. Which view is right? Research on catharsis suggests that acting angrily does not have any long-term power to reduce anger. If the catharsis hypothesis were correct, war should have a cathartic effect in reducing anger and aggression, but a study of wars in 110 countries since 1900 showed that warfare actually stimulated domestic violence (Archer & Gartner, 1976; Archer & McDaniel, 1995). Compared with nations that remained at peace, postwar nations saw an increase in homicide rates. As psychologist Carol Tavris (1989) says in her book *Anger: The Misunderstood Emotion*, one of the main results of the ventilation approach to anger is to raise the noise level of our society, not to reduce anger or solve our problems. Individuals who are the most prone to anger get angrier, not less angry. Ventilating anger often follows a cycle of a precipitating event, an angry outburst, shouted recriminations, screaming or crying, a furious peak (sometimes accompanied by physical assault), exhaustion, and a sullen apology or just sullenness.

Every person gets angry at one time or another. How can we control our anger so it does not become destructive? Mark Twain once remarked, "When angry, count four; when very angry, swear." Tavris (1989) would agree with Twain's first rule, if not the second. She makes the following recommendations:

1. When your anger starts to boil and your body is getting aroused, work on lowering the arousal by waiting. Emotional arousal will usually decrease if you just wait long enough.
2. Cope with the anger in ways that involve neither being chronically angry over every little annoyance nor passively sulking, which simply rehearses your reasons for being angry.
3. Form a self-help group with others who have been through similar experiences with anger. The other people will likely know what you are feeling, and together you might come up with some good solutions to anger problems.
4. Take action to help others, which can put your own miseries in perspective, as exemplified by the actions of the women who organized Mothers Against Drunk Driving or any number of people who work to change conditions so that others will not suffer as they did.
5. Seek ways of breaking out of your usual perspective. Some people have been rehearsing their "story" for years, repeating over and over the reasons for their anger. Retelling the story from other participants' points of view often helps people to find routes to empathy.

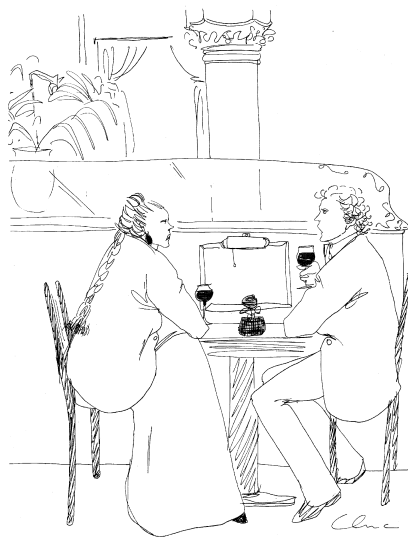
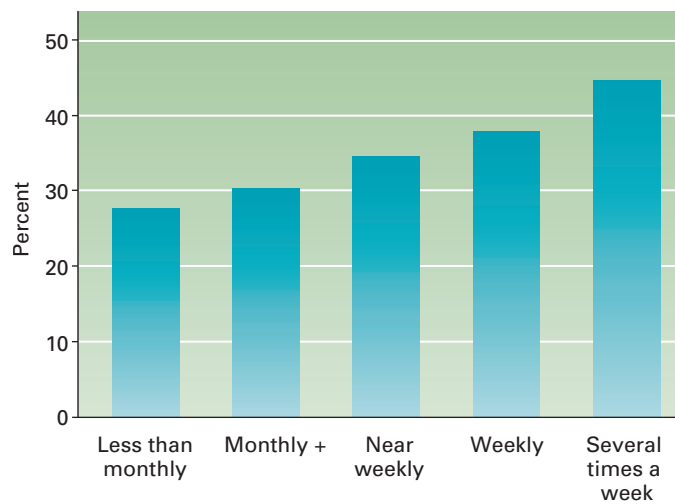
A Positive Emotion: Happiness Earlier in the chapter, we discussed well-being and raised the question of whether happiness is an important aspect of well-being. Indeed, some psychologists equate happiness with subjective well-being, although it was not until 1973 that *Psychological Abstracts*, the major source of psychological research summaries, included *happiness* as an index term.

Psychologists' interest in happiness focuses on positive ways we experience life, including cognitive judgments of our well-being (Diener, Lucas, & Oishi, 2001; Locke,

catharsis The release of anger or aggressive energy by directly or vicariously engaging in anger or aggression; the *catharsis hypothesis* states that behaving angrily or watching others behave angrily reduces subsequent anger.

FIGURE 11.20 Religious Attendance and Happiness

In surveys of more than 34,000 Americans from 1972 to 1996, the more often American adults attended religious services the more likely they were to say that they were “very happy.”



“My life is O.K., but it’s no jeans ad.”
Richard Cline © 1988 from The New Yorker
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2002). That is, psychologists want to know what makes you happy and how you perceive your happiness.

Many years ago, the French philosopher Jean-Jacques Rousseau described the subjective nature of happiness this way: “Happiness is a good bank account, a good cook, and a good digestion.” In a review of research on happiness, having a good cook and a good digestion were not on the list of factors that contribute to our happiness, but the following were (Diener & Seligman, 2002; Diener & others, 1999, 2001):

- 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 (see figure 11.20)

Some factors that many people believe are involved in happiness, such as age and gender, are not.

But what about Rousseau’s “good bank account”? Can we buy happiness? One study tried to find out if lottery winners are happier than people who have not received a landslide of money (Brickman, Coates, & Janoff-Bulman, 1978). Twenty-two major lottery winners were compared with 22 other people living in the same area of the city. The general happiness of the two groups did not differ when they were asked about the past, the present, and the future. The people who hadn’t won a lottery actually were happier doing mundane things, such as watching television, buying clothes, and talking with a friend.

Winning a lottery does not appear to be the key to happiness. What is important, though, is having enough money to buy life’s necessities. Extremely wealthy people are not happier than people who can purchase what they need. The message is clear: If you believe money buys happiness, think again (Diener, 1984).

Psychologist Ed Diener (1984) agrees that intense positive emotions—such as winning a lottery or getting a date with the person of your dreams—do not add much to a person’s general sense of well-being, in part because they are rare and in part because they can decrease the positive emotions and increase the negative emotions we feel in later circumstances. According to Diener, happiness boils down to the frequency of positive emotions and the infrequency of negative emotions. Diener’s view flies in the face of common sense; you would think that frequent, intense positive emotions and minimal nonintense negative emotions produce the most happiness. But the commonsense view fails to consider that intense positive moments can diminish the sensation of future



How might winning the lottery affect your happiness?

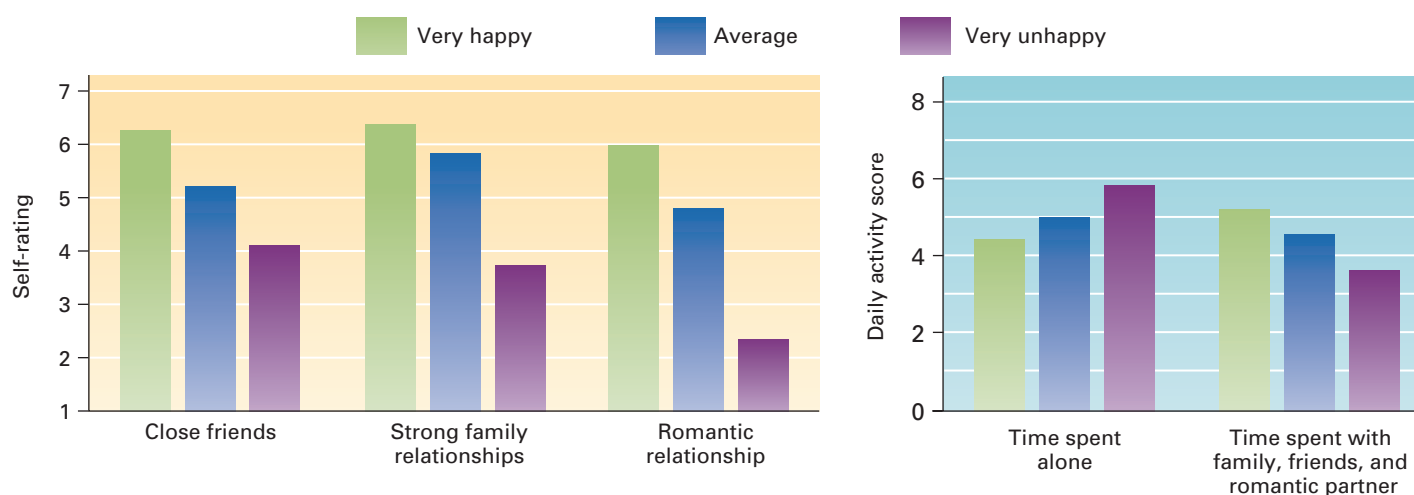


FIGURE 11.21 Characteristics of Very Happy College Students (Diener & Seligman, 2002)

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.

positive events. For example, if you shoot par in a round of golf, you will be overwhelmed with happiness at the time, but if you play golf a week later and do well but not as well, the previous emotional high can diminish your positive emotion this time. It is the rare human being, if such a person exists, who experiences intense positive emotions and infrequent negative emotions week after week after week.

Evolutionary psychologist David Buss (2000, 2004) believes that humans possess evolved mechanisms that can produce a deep sense of happiness. These include mating bonds, friendship, close kinship, and cooperative relationships. However, he cautions that some evolved mechanisms impede happiness. These include the distress created by jealousy and anger and the competition that benefits one person at the expense of another.

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 11.21).

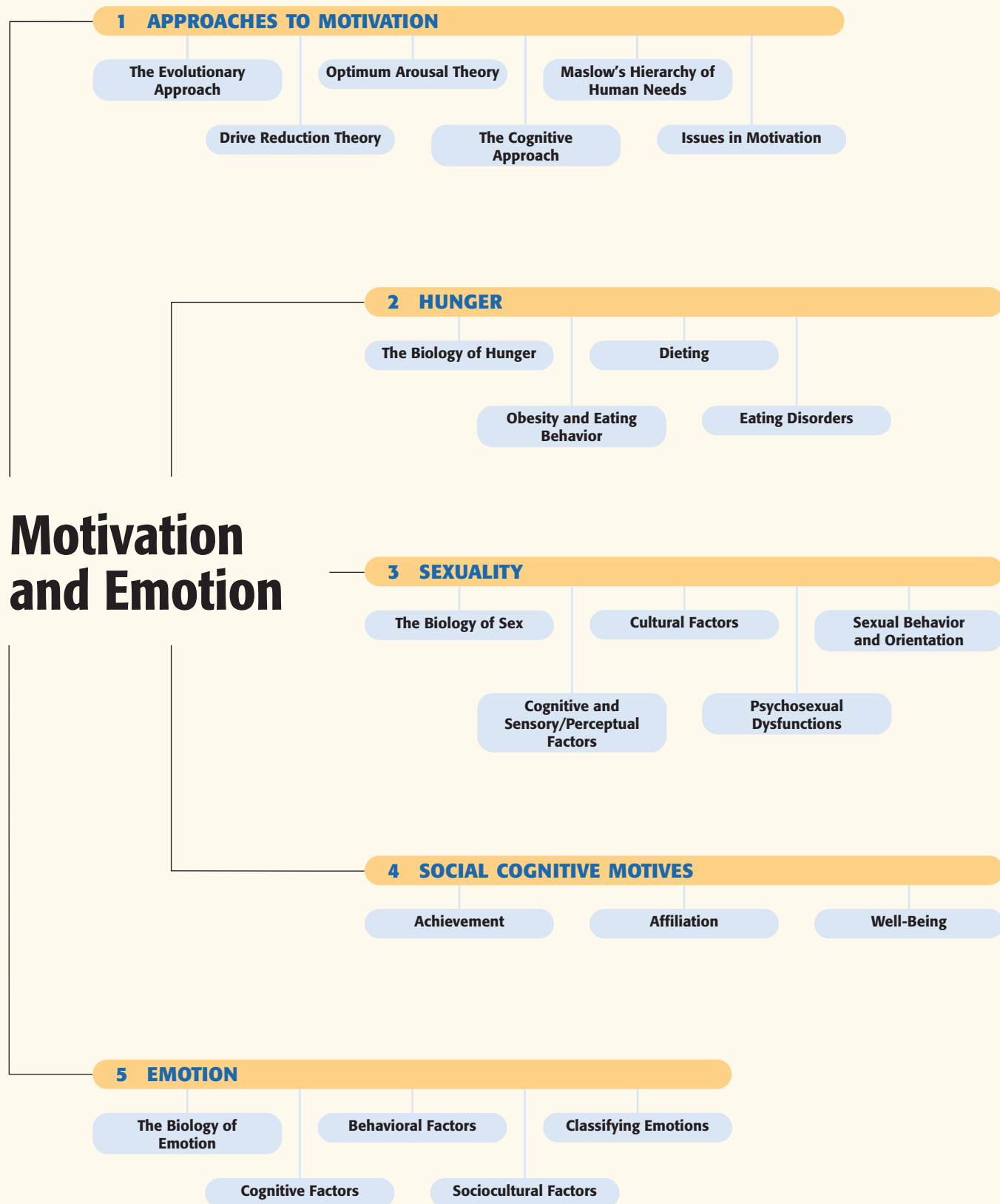
Review and Sharpen Your Thinking

5 Summarize views of emotion.

- Define emotion and explain the biology of emotion in terms of arousal and neural activity.
- Discuss the two-factor theory and the primacy debate over cognition and emotion.
- Describe behavioral expressions of emotion.
- Identify sociocultural similarities and differences in the expression of emotion.
- Compare the wheel model and the two-dimensional model of classifying emotions, and discuss the role of emotions in well-being.

Think about the last time you became angry. Compare how you handled your anger with the strategies recommended in the chapter. What strategies can you use to better control your anger? Is catharsis a good way to handle your anger? Explain.

Reach Your Learning Goals



1 Describe psychological approaches to motivation.

- Motivation gives our behavior, thoughts, and feelings a purpose. Motivated behavior is energized, directed, and sustained. 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 today. The evolutionary psychology view emphasizes that various aspects of motivation that provided evolutionary advantages were passed down through the genes from generation to generation.
- 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. Drive reduction theory was proposed as an explanation of motivation, with the goal of drive reduction being homeostasis, the body's tendency to maintain an equilibrium.
- Optimum arousal theory focuses on the Yerkes-Dodson law, which states that performance is best under conditions of moderate rather than low or high arousal. Moderate arousal often serves us best when we tackle life's tasks, but there are times when low or high arousal is linked with better performance. Sensation seeking is one aspect of the motivation for high arousal that psychologists study.
- The contemporary view of motivation emphasizes cognitive factors, including such information processing abilities as attention, memory, and problem solving. Psychologists debate how extensively motivation is influenced by conscious versus unconscious thought. Intrinsic motivation, based on internal factors such as self-determination, curiosity, challenge, and effort, is one of the most widely studied aspects of achievement motivation. Extrinsic motivation is based on external incentives, such as rewards and punishments. Most psychologists believe that intrinsic motivation is more positively related to achievement than extrinsic motivation is.
- According to Maslow's hierarchy of needs, our main needs are satisfied in this sequence: physiological, safety, love and belongingness, esteem, and self-actualization. Maslow gave the most attention to self-actualization, the motivation to develop to one's full potential.
- Three important issues in motivation are whether motivation is based on innate, unlearned, biological factors or learned, sociocultural, experiential factors; to what degree we are aware of what motivates us; and to what degree we are internally or externally motivated.

2 Explain the physiological basis of hunger and the nature of eating behavior.

- Interest in the stomach's role was stimulated by Cannon's classic research, but stomach signals are not the only factors that affect hunger. Glucose (blood sugar) is an important factor in hunger, probably because the brain is critically dependent on sugar for energy. Rodin's work helped clarify the role of insulin and glucose in hunger. Leptin, a protein secreted by fat cells, decreases food intake and increases energy expenditure. The hypothalamus plays an important role in regulating hunger. The lateral hypothalamus is involved in stimulating eating, the ventromedial hypothalamus 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 cues than normal-weight persons are, although there are individuals at all weight levels who respond more to external than to internal stimuli. Self-control is an important cognitive factor in eating behavior. Time and place affect eating, as does the type of food available. Our early ancestors ate natural fruits to satisfy nutritional needs, but today we fill up on the empty calories in candy and soda. 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, although some people do lose weight when they diet and maintain the loss. Exercise is an important component of a successful weight-loss program. Many people, especially in their teens and 20s, diet even if they don't need to lose weight. The pressure to be thin 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 motivations for sexual behavior.

- 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 have stronger concentrations 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 aphrodisiacs allegedly act as 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 a significant effect on sexual behavior.
- Psychosexual dysfunctions involve impairments in the sexual response pattern. Significant advances have been made in treating these dysfunctions in recent years.
- 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 by Kinsey and Hunt. The 1994 survey 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 **Characterize the social cognitive motives and how they influence behavior.**

- Early interest in achievement focused on need for achievement. Cognitive factors in achievement focus on intrinsic motivation, attribution, goal setting, planning, and monitoring. Attribution theory states that people are motivated to discover the underlying causes of behavior in an effort to make sense out of the behavior. The main emphasis in attribution theory has focused on internal causes, especially effort, and external causes. High achievers often set specific, proximal, and challenging goals. Individuals in the United States are often more achievement-oriented than individuals in other countries, although recent comparisons with Asian countries reveal higher achievement in those countries. A special concern is the achievement of individuals in ethnic minority groups. When both ethnicity and socioeconomic status (SES) are considered in the same study, SES usually is a better predictor of achievement than ethnicity.

Strategies based on achievement research are used in the workplace and in sports to motivate individuals to do their best.

- The need for affiliation (relatedness) is the motive to be with other people. It is a powerful motive in many people's lives. Cultures vary in how strongly they promote affiliation.
- Psychologists are increasingly interested in what constitutes the good life and well-being. One proposal is that well-being involves competence, autonomy, and affiliation.

5 **Summarize views of 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. The James-Lange theory states that emotion results from physiological states triggered by environmental stimuli: Emotion follows physiological reactions. The Cannon-Bard theory states that emotion and physiological reactions occur simultaneously. Contemporary biological views of emotion increasingly highlight neural circuitry and neurotransmitters. LeDoux has charted the neural circuitry of fear, which focuses on the amygdala and consists of two pathways, one direct and the other indirect. It is likely that positive and negative emotions use different neural circuitry and neurotransmitters.
- Schachter and Singer's two-factor theory states that emotion is the result of both physiological arousal and cognitive labeling. Lazarus believes that cognition always directs emotion, but Zajonc argues that emotion directs cognition. Both probably are right.
- 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 stereotype that women are emotional and men are not is just a stereotype. However, there are many contextual influences on 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. Both Plutchik's and Tompkins' lists of basic emotions reflect an evolutionary perspective. The two-dimensional approach to classifying emotions argues that there are just two broad dimensions of emotional experi-

ences: positive affectivity and negative affectivity. Positive emotions likely play an important role in well-being through adaptation, growth, social connection, and the building of personal and social resources.

Key Terms

motivation, p. 425

instinct, p. 425

drive, p. 425

need, p. 425

homeostasis, p. 426

Yerkes-Dodson law, p. 426

intrinsic motivation, p. 428

extrinsic motivation, p. 428

hierarchy of needs, p. 430

self-actualization, p. 430

basal metabolism rate

(BMR), p. 434

set point, p. 434

anorexia nervosa, p. 437

bulimia nervosa, p. 438

estrogens, p. 439

androgens, p. 439

human sexual response

pattern, p. 439

pheromones, p. 441

need for achievement,

p. 448

attribution theory, p. 448

need for affiliation, p. 453

emotion, p. 456

polygraph, p. 457

James-Lange theory, p. 457

Cannon-Bard theory, p. 458

two-factor theory of

emotion, p. 460

facial feedback

hypothesis, p. 462

display rules, p. 464

catharsis, p. 467

Apply Your Knowledge

1. Ask your friends to define the word *motivation*. Think about the way your friends define motivation 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 text? 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 could 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. 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

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