

## Key Questions/ Chapter Outline

## Core Concepts

## Psychology Matters

### 9.1 What Do Our Emotions Do for Us?

The Evolution of Emotions  
Counting the Emotions  
Cultural Universals in  
Emotional Expression

- Emotions help us to attend and respond to important situations and to convey our intentions to others.

### Emotional Differences between Men and Women Depend on Both Biology and Culture

Culture and socialization account for many of the differences—but not for everything.

### 9.2 Where Do Our Emotions Come From?

The Neuroscience of Emotion  
Psychological Theories of  
Emotion: Resolving Some  
Old Issues

- The discovery of two distinct brain pathways for emotional arousal has clarified how emotion works and has suggested solutions to long-standing issues in the psychology of emotion.

### Arousal, Performance, and the Inverted U

Increased arousal improves performance—but only up to a point. That point depends on the task.

### 9.3 How Much Control Do We Have over Our Emotions?

Developing Emotional  
Intelligence  
Detecting Deception

- Although emotional responses are not always consciously regulated, we can learn to control them.

### Controlling Anger

A common misconception says that it is healthy to ventilate your anger.

### 9.4 Motivation: What Makes Us Act as We Do?

How Psychologists Use the  
Concept of Motivation  
Types of Motivation  
Theories of Motivation  
The Unexpected Effects of  
Rewards on Motivation

- Motivation takes many forms, but all involve mental processes that arouse us and then select and direct our behavior.

### Using Psychology to Learn Psychology

When you study, try to get into a state of *flow*.

### 9.5 How Are Achievement, Hunger, and Sex Alike? Different?

Achievement Motivation  
Hunger Motivation  
Sexual Motivation

- No single theory accounts for all forms of motivation because each motive involves its own mix of biological, mental, behavioral, and social/cultural influences.

### A Question of Will Power, Laughter, and Chocolate Cookies

Psychologists prefer “self-control” or “impulse control,” because “will power” implies a separate mental faculty that can be better explained in biological or behavioral terms.

## Critical Thinking Applied:

Do “Lie Detectors” Really Detect Lies?

## chapter 9 emotion and motivation



Elliot presented a puzzle. His life was unraveling, yet he maintained an attitude of composure. Once a model employee, he had let the quality of his work slip to the point that he finally lost his job. If anything, said his supervisors, Elliot had become almost too focused on the details of his work, yet he had trouble setting priorities. He often latched onto a small task, such as sorting a client's paperwork, and spent the whole afternoon on various classification schemes—never quite getting to the real job he had been assigned (Damasio, 1994).

His personal life also fell apart. A divorce was followed by a short marriage and another divorce. Several attempts at starting his own business involved glaringly flawed decisions that finally ate up all his savings.

Yet, surprisingly, in most respects Elliot seemed normal. He had a pleasant personality and an engaging sense of humor. He was obviously smart—well aware of important events, names, and dates. He understood the political and economic affairs of the day. In fact, examinations revealed nothing wrong with his movements, memory, perceptual abilities, language skills, intellect, or ability to learn.

Complaints of headaches led the family doctor to suspect that the changes in Elliot might be the result of a brain lesion. Tests proved the suspicion correct. Brain scans showed a mass the size of a small orange that was pressing on the frontal lobes just above Elliot's eyes.

The tumor was removed, but not before it had done extensive damage. The impact, limited to the frontal lobes, bore a remarkable similarity to that of the notorious Phineas Gage, whom you met in Chapter 2. Like Gage, Elliot had undergone a profound change as the result of frontal lobe damage. But the effects in Elliot were more subtle than in Gage. As a psychologist who examined him said, "We might summarize Elliot's predicament as *to know but not to feel*" (Damasio, 1994, p. 45). His reasoning abilities were intact, but the damage to the circuitry of Elliot's frontal lobes disrupted his ability to use his emotions to establish priorities among the objects, events, and people in his life. In short, Elliot had been emotionally crippled. With a disruption in his ability to connect concepts and emotions, Elliot could not value one course of action over another.

**PROBLEM:** What does Elliot's case—along with studies of the emotional pathways in the brain—tell us about the role of emotions in our thinking?

One of the most pervasive misunderstandings about the human mind is the idea that emotion is the opposite of reason. But the cases of Elliot, Phineas Gage, and others with similar problems make it clear that emotion is a vital ingredient in making effective personal decisions (Gray, 2004). In this chapter we will explore some discoveries about how the brain processes emotions and what these discoveries mean about the intimate connection between emotion and reason.

So, what is this thing called emotion? In brief, **emotion** has four intersecting components: *physiological arousal*, *cognitive interpretation*, *subjective feelings*, and *behavioral expression*. Let's illustrate with a happy example.

Suppose that you win a cool \$50 million in the lottery. Chances are that the news will make you jump and shout, your heart race, and a wave of joy wash over your brain. Congratulations: You have just had an emotion, the *physiological arousal* component of which involves an alarm broadcast simultaneously throughout the autonomic nervous system and the endocrine system. The result is an extensive visceral response that includes your racing heart.

The second component of emotion, a *cognitive interpretation* of events and feelings, involves a conscious recognition and interpretation of the situation. Undoubtedly, you would interpret the news about your winning lottery ticket as good fortune. The same processes—both conscious and unconscious—can happen with unpleasant experiences, too. (Think of a hungry bear chasing you.) Such negative experiences, especially those associated with anxiety and fear, can lead to the psychological disorder known as *phobia*.

The *subjective feeling* component of your fear may come from several sources. One involves the brain sensing the body's current state of arousal (Damasio, 1994, 2003). The other comes from memories of the body's state in similar situations in the past. There the brain stores a sort of emotional "body-image" that Antonio Damasio calls a *somatic marker*. (Perhaps you were overjoyed at winning a raffle at school, when you were a child. That association can carry over and attach to the present situation, much as Pavlov's dogs associated a tone with food.) Similarly, in response to the hungry bear, your brain would retrieve a body-image memory of how you felt during past encounters with danger.

**CONNECTION • CHAPTER 12**

Phobias are one form of *anxiety disorder*.

**Emotion** A four-part process that involves physiological arousal, subjective feelings, cognitive interpretation, and behavioral expression. Emotions help organisms deal with important events.

The recently discovered “mirror neuron” system is another source of emotional feelings. These brain circuits activate to make you feel an emotion when you see someone else’s emotional state, as in a sad movie (Miller, 2006c; Niedenthal, 2007). In our hungry bear example, your mirror neurons may reflect the emotions of a companion who sees the bear before you do. Numerous studies support this conjecture, but one of the more interesting ones looked at the brain scans of romantically involved couples, finding that when one had an unpleasant experience, both showed essentially the same changes in the emotion-related parts of the brain (Singer et al., 2004).

Finally, the fourth component of emotion produces an *expression of emotion in behavior*. So, when you learned of your lottery winnings, you probably smiled, gave a shout of joy, and perhaps danced around the room, as you babbled the news to your companions. Alternatively, the sight of a hungry bear most likely would activate the “fight-or-flight” response, as well as in emotion-laden facial expressions and vocalizations, such as crying, grimacing, or shouting. If a person were angry, the response might also be accompanied by voluntary gestures, such as waving a fist or pointing out one’s state of mind with the middle finger.

Because this chapter is titled “Emotion and Motivation,” we might ask: How is emotion linked to motivation? Note that both words share a common root, “*mot-*,” from the Latin *motus*, meaning “move.” The psychology of motivation and emotion has retained this meaning by viewing emotion and motivation as intimately related processes. We can think of emotions simply as one very important class of motives that help us respond to events of importance to us.

#### CONNECTION • CHAPTER 2

“Mirror neurons” allow us to understand others’ behaviors, emotional states, and intentions.

## 9.1 KEY QUESTION WHAT DO OUR EMOTIONS DO FOR US?

The death of a friend, an insult, winning an award, losing a lover to a rival: All induce strong feelings—sorrow, anger, joy, jealousy. But, what do these states have in common? Why do we put them all in the same category called “emotion”? The common thread is this: All emotions involve a state of mental and physical arousal focused on some event of importance to the individual.

And what functions do these emotional responses serve? Surely emotions must do more than just adding variety or “color” to our mental lives. The brief answer to the question is given by our Core Concept:

**Emotions help us to attend and respond to important situations and to convey our intentions to others.**

core  
concept

In this section, we will first consider the adaptive functions of emotions from an evolutionary perspective. Next, we will add a social perspective to see how the language of emotional expression tells others of our emotional state. Finally, at the end of this section, we will consider the issue of gender differences in emotion and how they are shaped by culture.

### The Evolution of Emotions

Whether they occur in humans, hyenas, cats, or kangaroos, emotions serve as arousal states that signal important events, such as a threat or the presence of a receptive mate. They also become etched in memory, to help the organism recognize such situations quickly when they recur (Dolan, 2002; LeDoux, 1996). And our ability to connect emotional memories to new situations accounts for emotions as diverse as the fear generated by a hungry bear, the joy produced by a winning lottery ticket, or an A on a term paper.



**CONNECTION • CHAPTER 2**

The amygdala is a part of the limbic system that is particularly involved in fear.

In general, our emotions are either *positive* or *negative*, and they also involve a tendency for *approach* or *avoidance* (Davidson et al., 2000). The “approach” emotions, such as delight and joy, are generally positive, and they make a person, object, or situation attractive (as when we feel drawn to a friend). Brain scans suggest that these approach emotions involve the dopamine reward system in the brain. In contrast, most of the negative emotions, such as fear and disgust, are associated with rejection or avoidance (as when we fear going to the dentist). These avoidance emotions usually involve the amygdala.

Because our most basic emotions well up in situations that can affect our survival, they have been shaped by natural selection (Gross, 1998; Izard, 2007). Fear, for example, undoubtedly helped individuals in your family tree avoid to situations that could have made them a meal instead of an ancestor. Similarly, the emotion we call “love” may commit us to a family, which helps to continue our genetic line. Likewise, sexual jealousy can be seen as an emotion that evolved to deal with the biologically important problem of mate infidelity, which threatens the individual’s chances of producing offspring (Buss & Schmitt, 1993). Humor, too, may have evolved to serve a social purpose, as we can surmise from the “in-jokes” and rampant laughter among people in tightly knit social groups (Provine, 2004; Winerman, 2006d).

We glimpsed yet another important-but-little-known function of emotions in Elliot’s story at the beginning of the chapter. As you will recall, his tumor interfered not only with his ability to process emotion but with his judgment. The cases of Elliot and others like him show that our emotions help us make decisions, because they us attach values to the alternatives we are considering (De Martino et al., 2006; Miller, 2006a).

You probably know someone who is “warm hearted” and someone else whom you might call a “cold fish.” These extremes represent the important biological fact that people vary tremendously in emotional responsiveness (Davidson, 2000b). We see this, for example, in differing tendencies for depression. Some of these individual differences arise from random genetic variations—genetic “accidents.” Others tend to run in families and so are inherited (Gabbay, 1992).

But we should emphasize that emotions are not entirely programmed by genetics. They also involve learning—that is, they arise out of our experiences. Particularly important in setting emotional temperament are experiences that occur early in life, as well as experiences that have evoked strong emotional responses (Barlow, 2000; LeDoux, 1996). Thus, learned emotional responses, along with a biological disposition for emotionality, can be important components of many psychological disorders, including depression, panic attacks, and phobic reactions—to name just a few.



*Sexual jealousy probably has an evolutionary basis because mate infidelity threatens the individual’s chances of producing offspring.*

## Counting the Emotions

How many emotions are there? A long look in the dictionary turns up more than 500 emotional terms (Averill, 1980). Most experts, however, see a more limited number of *basic emotions*. Carroll Izard (2007) argues for six: interest, joy/happiness, sadness, anger, disgust, and fear. Paul Ekman’s list contains seven: anger, disgust, fear, happiness, sadness, contempt, and surprise—based on the universally recognized facial expressions. And Robert Plutchik (1980, 1984) has made a case for eight basic emotions that emerged from a mathematical analysis of people’s ratings of a large number of emotional terms. Recent research suggests that Plutchik’s list might even be expanded to include pride (Azar, 2006; Tracy & Robins, 2006). Even though different theorists approach the problem in different ways, their differences are relatively minor. Plutchik’s list, shown in Figure 9.1, is typical, capturing the essential idea that we have a limited number of basic emotions.

But what about emotions that appear on none of these basic lists? What of envy, regret, or mirth? Those who argue for a simplified list of basic emotions,

suggest that a larger palette of *secondary emotions* involves blends of the more basic emotions. So, for example, Plutchik's theory describes optimism as a blend of anticipation and joy, as you can see in Figure 9.1.

## Cultural Universals in Emotional Expression

You can usually tell when a friend is happy or angry by the look on her face or by her actions. This can be useful in deciding whether to spend Friday evening with her at the movies. More generally, as our Core Concept suggests, communication through emotional expression aids our social interactions. But does raising the eyebrows and rounding the mouth convey the same message in Minneapolis as it does in Madagascar? Much research on emotional expression has centered on such questions.

According to Paul Ekman, the leading authority on facial expression of emotions, people speak and understand the same basic “facial language” the world around (Ekman, 2003). Ekman's group has demonstrated that humans share a built-in set of emotional expressions that testify to the common biological heritage of the human species. Smiles, for example, usually signal happiness, and frowns indicate sadness on the faces of people in such far-flung places as Argentina, Japan, Spain, Hungary, Poland, Sumatra, the United States, Vietnam, the jungles of New Guinea, and the Eskimo villages north of the Arctic Circle (Biehl et al., 1997).

Perhaps it won't surprise you to learn that gender makes a difference in what we read into other people's facial expressions. One study found a bias toward seeing anger in men's faces and happy expressions in women's faces (Becker et al., 2007). This finding makes sense from an evolutionary perspective, of course, because angry men have always been a source of danger, while a happy woman's face may have signaled safety (Azar, 2007).

You can check your own skill at interpreting facial expressions by taking the quiz in the “Do It Yourself!” box on the next page. Ekman and his colleagues claim that people everywhere can recognize at least seven basic emotions: sadness, fear, anger, disgust, contempt, happiness, and surprise. Nevertheless, huge differences exist across cultures in both the context and intensity of emotional displays—because of so-called **display rules**. In many Asian cultures, for example, children are taught to control emotional responses—especially negative ones—while many American children are encouraged to express their feelings more openly (Smith et al., 2006). As a result, people are generally better at judging emotions of people from their own culture than in members of another cultural group (Elfenbein & Ambady, 2003).

Regardless of culture, babies express emotions almost at birth. In fact, a lusty cry is a sign of good health. And from their first days of life, babies display a small repertoire of facial expressions that communicate their feelings (Ganchrow et al., 1983). Likewise, the ability to read facial expressions develops early (but not so early as emotional expression). Very young children pay close attention to facial expressions, and by age 5 they nearly equal adults in their skill at reading emotions in people's faces (Nelson, 1987).

All this work on facial expressions points to a biological underpinning for our abilities to express and interpret a basic set of human emotions. Moreover, as Charles Darwin pointed out over a century ago, some emotional expressions seem to appear across species boundaries. Darwin especially noted the similarity of our own facial expressions of fear and rage to those of chimpanzees and wolves (Darwin, 1998/1862; Ekman, 1984).



**FIGURE 9.1**  
The Emotion Wheel

Robert Plutchik's emotion wheel arranges eight primary emotions on the inner ring of a circle of opposite emotions. Pairs of adjacent emotions can combine to form more complex emotions noted on the outer ring of the figure. For example, love is portrayed as a combination of joy and acceptance. Still other emotions, such as envy or regret (not shown), emerge from still other combinations of more basic emotions portrayed on the wheel.

(Source: From R. Plutchik, “A Language for the Emotions,” *Psychology Today*, February 1980. Copyright © 1980. Used with permission of *Psychology Today* © 2008.)

**Display rules** The permissible ways of displaying emotions in a particular society.

**DO IT YOURSELF!****Identifying Facial Expressions of Emotion**

Take the facial emotion identification test to see how well you can identify each of the seven emotions that Ekman claims are culturally universal. Do not read the answers until you have matched each of the following pictures with one of these emotions: disgust, happiness, anger, sadness, surprise, fear, and contempt. Apparently, people everywhere in the world interpret these expressions in the same way. This tells us that certain facial expressions of emotion are probably rooted in our human genetic heritage.



**Answers** The facial expressions are (top row from left) happiness, surprise, anger, disgust; (bottom row) fear, sadness, contempt.

But are *all* emotional expressions universal? Cross-cultural psychologists tell us that certain emotional responses carry different meanings in different cultures (Ekman, 1992, 1994; Ellsworth, 1994). These, therefore, must be learned rather than innate. For example, what emotion do you suppose might be conveyed by sticking out the tongue? For Americans this might indicate disgust or fatigue, while in China it can signify surprise. Similarly, a grin on an American face may indicate joy, while on a Japanese face it may just as easily mean embarrassment. To give one more example, a somber expression and downcast eyes might indicate unhappiness to someone in a Euro-American culture, whereas it could be a sign of respect to many Asians. Clearly, culture influences emotional expression.

## PSYCHOLOGYMATTERS

### Emotional Differences between Men and Women Depend on Both Biology and Culture

You may have suspected that some emotional differences between males and females have a biological basis. This would explain, for example, why certain emotional disturbances, such as panic disorder and depression, occur more commonly in women. Biological differences may also explain why men show more anger and display more physiological signs of emotional arousal during interpersonal conflicts than do women (Fischer et al., 2004). Anger, of course, can lead to violence—and men commit most of the world's violent acts.

Some gender differences, however, may depend as much on culture as on biology. For instance, in the United States, males and females may learn quite different lessons about emotional control. Display rules dictate that men and boys show their anger (Fischer, 1993). Indeed, they may be rewarded for displays of anger and aggression. On the other hand, they may also be punished for “weak” emotional displays such as crying, depression, and sadness (Gottman, 1994). Meanwhile, the pattern of reinforcement and punishment is reversed for females. Women and girls may receive encouragement for emotions that show vulnerability. But they may be punished for displaying emotions that suggest dominance (Fischer et al., 2004).

- Despite these differences, neither sex is more emotionally expressive overall.
- Rather, cultures differ in emotional expression much more than do the sexes (Brannon, 2008; Wallbott et al., 1986). In Israel and Italy, for example, men more often than women hide their feelings of sadness. The opposite holds true in Britain, Spain, Switzerland, and Germany, where women are more likely than men to hide sadness. In many collectivist cultures, as we have noted, both genders learn display rules to restrain all their emotional expressions. Overall, however, the differences among individuals overshadow the differences of either gender or culture.

## Check Your Understanding

1. **RECALL:** What are four main components of emotions?
2. **RECALL:** Name an emotion that is *not* one of the culturally universal emotions identified by Ekman's research.
3. **ANALYSIS:** Give an example that illustrates how *display rules* can modify the universal facial expressions of emotion.
4. **RECALL:** What differences in emotional expression of men and women seem to be heavily influenced by culture?
5. **UNDERSTANDING THE CORE CONCEPT:** According to this section of the chapter, what is the adaptive value of communicating our emotional states?
  - a. To help us understand our own needs better
  - b. To help us deceive others about our emotional states and get what we want
  - c. To help us anticipate each other's responses and so to live more easily in groups
  - d. To help us get rid of strong negative emotions, such as fear and anger

**Answers** 1. Four main components of emotions: physiological arousal, cognitive interpretation, subjective feelings, and behavioral expression. 2. Pride, optimism, jealousy, envy, anxiety—in fact, any emotion other than Ekman's seven universal emotions: sadness, fear, anger, disgust, contempt, happiness, and surprise. 3. Smiles may indicate happiness in some cultures and embarrassment in others. Other examples are mentioned in the section on display rules. 4. Cultures often encourage men to show emotions related to anger, aggression and dominance, while they encourage women to show emotions related to compliance and submission. 5. c; our emotions convey our intentions to others.

## 9.2 KEY QUESTION WHERE DO OUR EMOTIONS COME FROM?

Suppose that you are touring a “haunted house” at Halloween, when a filmy figure startles you with ghostly “Boo!” Your emotional response is immediate. It may involve an outward reaction, such as jumping, gasping, or screaming. At the same time, you respond internally, with changes in your body chemistry, the function of your internal organs, and arousal in certain parts of your brain and autonomic nervous system. Moreover, these gut-level responses, such as an accelerated heart beat, can persist long after the you realize that you were really in no danger—after you realize that you were fooled by someone dressed in a sheet.

This suggests that emotion operates on both the conscious and unconscious levels. And that idea connects to one of the great recent discoveries in psychology: the existence of two emotion pathways in the brain. These dual pathways are the focus of the Core Concept for this section:

**The discovery of two distinct brain pathways for emotional arousal has clarified how emotion works and has suggested solutions to long-standing issues in the psychology of emotion.**

core  
concept

In the following pages we will see how the young neuroscience of emotion has begun to identify the machinery that produces our emotions. The details have not yet become entirely clear, but we do have a broad-brush picture of the emotion pathways in the brain and their connections throughout the body. In this section we will first see how the two emotion pathways work. Then we will see how they have helped resolve some long-standing disputes in the field. Finally, at the end of this section, we will turn to a practical application, to learn how



emotional arousal can affect our performance—say, on an examination or in an important athletic contest.

## The Neuroscience of Emotion

People who suffer from phobias, such as an intense fear of snakes, usually know that their responses are irrational. But what causes a person to hold two such conflicting mind sets? The answer lies in the brain's two distinct emotion processing systems (LeDoux, 1996, 2000).

**Emotions in the Unconscious** One emotion system—a *fast response system*—operates mainly at an unconscious level, where it quickly screens incoming stimuli and helps us respond quickly to cues of potentially important events, even before they reach consciousness. This system, linked to *implicit memory*, acts as an early-warning defense that produces, for example, a near-instantaneous fright response to an unexpected loud noise (Helmuth, 2003b). It relies primarily on deep-brain circuitry that operates automatically, without requiring deliberate conscious control. (See Figure 9.2.)

Thanks to natural selection, these unconscious emotion circuits seem to have a built-in sensitivity to certain cues—which explains why fears of spiders and snakes are more common than fears of, say, electricity (which actually causes more deaths than do spiders and snakes but has only recently in human history become a common cause of death). In addition, this quick-response system can easily learn emotional responses through classical conditioning—but it can also be slow to forget. Thus, a person may quickly learn to fear dogs

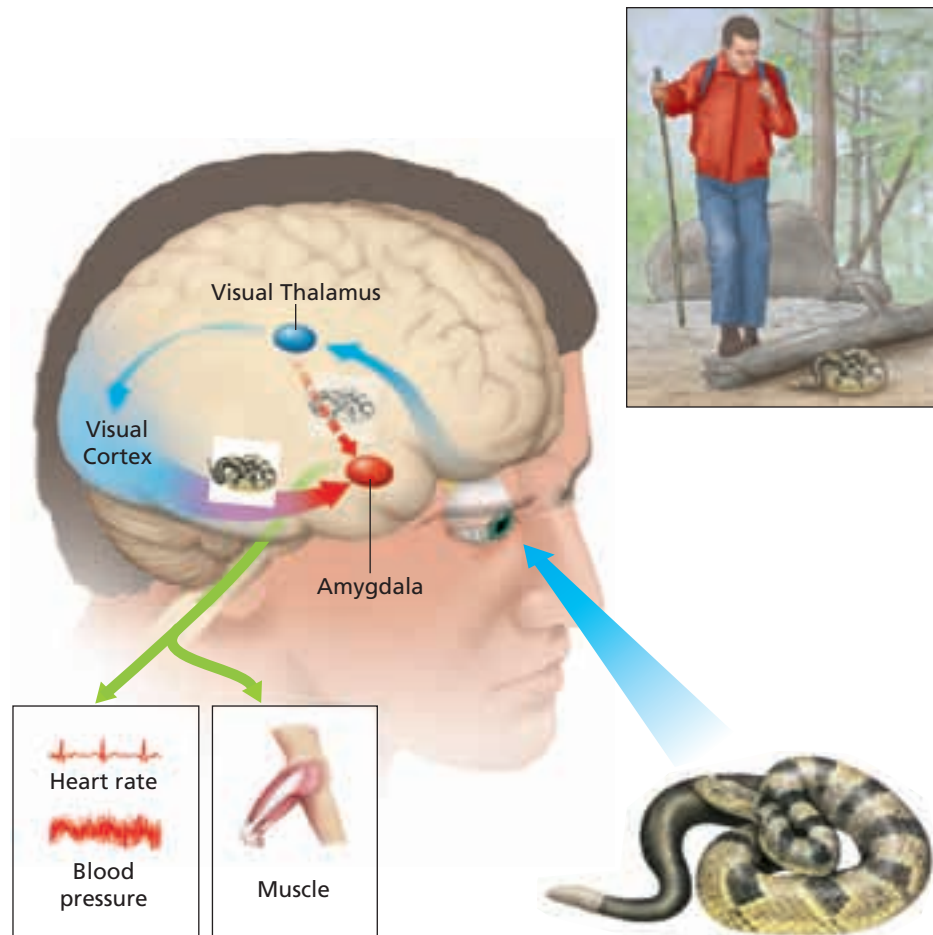
### CONNECTION • CHAPTER 4

Implicit memories involve material of which we are unaware—but that can affect behavior.

**FIGURE 9.2**

#### Two Emotion-Processing Pathways

Two emotion systems are at work when the hiker sees a snake. One is fast and unconscious; the other operates more slowly and consciously. The fast system routes incoming visual information through the visual thalamus to the amygdala (dotted pathway), which quickly initiates fear and avoidance responses—all occurring unconsciously. The slower pathway involves the visual cortex, which makes a more complete appraisal of the stimulus and also sends an emotional message to the amygdala and other lower brain structures. The result of this is a conscious perception of the situation and a conscious feeling of fear.



after being bitten, yet the emotional memory of the incident may be quite difficult to extinguish.

**Conscious Emotional Processing** The other emotional system—the one that involves conscious processing—is linked to *explicit memory* (LeDoux, 1996; Mather, 2007). Its circuitry can create, for example, the fear that grows in your mind when you anticipate giving a speech. This conscious system generates emotions more slowly than the unconscious pathways, but it is more thorough and deliberate. Relying heavily on the cerebral cortex, your conscious view of events can differ significantly from that of your unconscious processing system. Thus, if you have a phobia, you can feel fear, despite “knowing” that there is no sensible basis for the feeling.

**The Interaction of Conscious and Unconscious Emotions** As you can see, then, the brain has no “emotion center” (Davidson, 2000a). Rather, it has many emotion-related circuits that serve the two distinct emotion systems. And, to complicate matters, these two systems also interact. As a result, the feelings that we associate with an emotion such as fear can well up into consciousness from the unconscious system. This process may produce the feelings that we call “intuition” (Myers, 2002). Alternatively, the conscious emotional system can signal fear to the unconscious circuits, which might produce the knot in your stomach just before giving a speech.

Let us take a more detailed look at these biological mechanisms at work behind our emotions.

**The Limbic System’s Role in Emotion** Both emotion pathways rely on circuits in the brain’s limbic system, as you can see in Figure 9.2. Situated in the layer above the brain stem, the limbic structures undoubtedly evolved as control systems for behaviors used in attack, defense, and retreat: the “fight-or-flight” response (Caldwell, 1995; LeDoux, 1994, 1996). Evidence for this comes from lesioning (cutting) or electrically stimulating parts of the limbic system, which can produce dramatic changes in emotional responding. Depending on which part of the limbic system is affected, tame animals may become killers, whereas prey and predators may become peaceful companions (Delgado, 1969).

Particularly well documented is the importance of the amygdala in the emotion of fear (LeDoux, 1996; Whalen, 1998). Like a guard dog, the amygdala stands alert for threats, and it may have a role in positive emotions, too (Hamann et al., 2002; Helmuth, 2003a). As you can see in the figure, the amygdala receives messages from the quick-and-unconscious emotion-processing pathway, as well as the longer-and-slower conscious pathway.

**The Cerebral Cortex’s Role in Emotion** The cerebral cortex—the outermost layer of brain tissue and our “thinking cap”—plays the starring role in the conscious emotion pathway, where it both interprets events and associates them with memories and feelings. This connection, as we have seen, helps us make decisions by attaching emotional values to alternative choices we face, such as: Do I want chocolate or strawberry? or, Do I want to save my money or buy a new stereo?

Neuroscientists now think they know where emotion and reason meet in the brain. It’s a small patch of brain with a big name: the *ventromedial prefrontal cortex (VMPFC)*. Located on the floor of the brain’s frontal lobes, just behind the eyes, the VMPFC has extensive connections with both the amygdala and the hippocampus, at the heart of the brain’s emotion circuitry (Wagar & Thagard, 2006). There, like a recording technician combining inputs for a sound track, the VMPFC mixes external stimulation with the body’s “gut” reaction and converts the result into an emotional memory: Was it positive or negative? Did it make your skin creep? Did you feel a lump in your throat? A knot in your stomach? Thanks to your VMPC most of your memories probably have such visceral associations attached.

When faced with a decision—perhaps between Italian or Chinese take-out or between spending a vacation in the mountains or at the shore—positive or negative associations spring to mind as you mull each alternative. When we “weigh” our choices, we are actually balancing the positives and negatives of these associations. You will recall, in our opening vignette, that is exactly what Elliot was not able to do as the result of the tumor in his frontal lobes.

One other cortical quirk deserves mention: The two frontal lobes have complementary roles in controlling our emotions. Just as distinct patches of cortex produce different sensations, positive and negative emotions are associated with opposite hemispheres, an effect called **lateralization of emotion**. The evidence comes from EEG recordings of normal people’s emotional reactions, along with EEGs of people with damage to the right or left hemisphere (Davidson et al., 2000). In general, the right hemisphere specializes in negative emotions, such as anger and depression, while the left processes more positive, joyful emotions (Kosslyn et al., 2002).

#### CONNECTION • CHAPTER 2

The autonomic nervous system controls the internal organs, along with many signs of emotional arousal.

**Lateralization of emotion** Different influences of the two brain hemispheres on various emotions. The left hemisphere apparently influences positive emotions (for example, happiness), and the right hemisphere influences negative emotions (anger, for example).

**The Autonomic Nervous System’s Role in Emotion** When you become emotionally aroused, the messages that you “take to heart” (and to your other internal organs) are routed through the autonomic nervous system (Levenson, 1992). The parasympathetic division usually dominates in pleasant emotions. But when you are startled or when you experience some unpleasant emotion, the sympathetic division becomes more active. (See Table 9.1.)

Suppose an emergency—or merely the memory of an emergency—occurs (A speeding car is coming directly at you!). The brain alerts the body by means of messages carried along pathways of the sympathetic system. Some signals direct the adrenal glands to release stress hormones. Others make the heart race and blood pressure rise. At the same time, the sympathetic system directs certain blood vessels to constrict, diverting energy to the voluntary muscles and away from the stomach and intestines. (This causes the feeling of a “knot” in your stomach.) Then, when the emergency has passed, the parasympathetic division takes over, carrying instructions that counteract the emergency orders of a few moments earlier. You may, however, remain aroused for some time after experiencing a strong emotional activation because hormones continue to circulate in the bloodstream. If the emotion-provoking situation is prolonged (as when you work every day for a boss whom you detest), the emergency response can sap your energy and cause both physical and mental deterioration.

#### CONNECTION • CHAPTER 13

Drugs that inhibit the reuptake of serotonin are often used to treat depression.

**The Hormones’ Role in Emotion** Your body produces dozens of hormones, but among the most important for your emotions are serotonin, epinephrine (adrenalin), and norepinephrine. Serotonin is associated with feelings of depression. Epinephrine is the hormone produced in fear. Norepinephrine is more abundant in anger.

**TABLE 9.1 Responses Associated with Emotion**

Component of emotion	Type of response	Example
Physiological arousal	Neural, hormonal, visceral, and muscular changes	Increased heart rate, blushing, becoming pale, sweating, rapid breathing
Subjective feelings	The private experience of one’s internal affective state	Feelings of rage, sadness, happiness
Cognitive interpretation	Attaching meaning to the emotional experience by drawing on memory and perceptual processes	Blaming someone, perceiving a threat
Social/behavioral reactions	Expressing emotion through gestures, facial expressions, or other actions	Smiling, crying, screaming for help

Steroid hormones (the same ones abused by some bodybuilders and other athletes) exert an especially powerful influence on our emotions. In addition to their effects on muscles, steroids act on nerve cells, causing them to change their excitability. This is a normal part of the body's response to emergency situations. But when steroid drugs are ingested over extended periods, these potent chemicals have the effect of keeping the body (including the brain) in a continual emergency state. Brain circuits, especially those associated with arousal, threat, stress, and strong emotions may remain in a state of heightened alert. One of the results may be tendencies to “roid” rage or depression (Daly et al., 2003; Miller et al., 2002). You will learn more about the effects of steroid hormones in our discussion of stress in Chapter 14.

## Psychological Theories of Emotion: Resolving Some Old Issues

Borrowing an illustration from the late great William James, let's suppose that you have the unlikely misfortune to encounter a hungry bear while on your way to class one morning. We will bet that you will experience the emotion of fear. But what internal process actually produces your fearful sensation? Does it come from the thought, “Uh-oh. I'm in danger”? Or does it come from sensing your racing heart and wrenching gut? And, you may be wondering, why would anyone care where emotions come from?

In response to the last question: Psychologists have long argued over the relationship between emotion, cognition, and physical responses—not only out of intellectual curiosity but because an understanding of emotion is a key to finding effective treatments for certain emotional problems, such as panic attacks and depression, as well as the everyday problems of anger, envy, and jealousy. Should we try to treat anger, for example, by targeting thoughts, visceral reactions, or angry behaviors? Or should we treat the brain itself with chemicals?

Recent discoveries in neuroscience have helped psychologists resolve some long-disputed issues surrounding the interaction of biology, cognition, and behavior in emotion. Let's look briefly at these controversies and how new insights have begun to resolve them.

**Do Our Physical Responses Produce Our Emotions?** In the early days of psychology, just over a century ago, William James taught that our physical responses underlie our emotions. “We feel sorry because we cry, angry because we strike, afraid because we tremble,” James said (1890/1950, p. 1006). As for the bear we mentioned earlier, James argued that you would not run from the bear because you are afraid, but you feel afraid because you run. While this statement may appear absurd on its face, James is really saying something quite sensible—that emotions require a *combination* of cognitions and physical sensations:

Without the bodily states following on the perception [of the bear], the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we could not actually *feel* afraid or angry.

This view, simultaneously proposed by the Danish psychologist Carl Lange, became known as the **James–Lange theory**.

Other scientists, notably Walter Cannon and Philip Bard, objected that physical changes in our behavior or our internal organs occur too slowly to account for split-second emotional reactions, such as those we feel in the face of danger. They also objected that our physical responses are not varied enough to account for the whole palette of human emotion. In their view, referred to as the **Cannon–Bard theory**, the emotional feeling and the internal physical response occurred simultaneously.

**James–Lange theory** The proposal that an emotion-provoking stimulus produces a physical response that, in turn, produces an emotion.

**Cannon–Bard theory** The counterproposal that an emotional feeling and an internal physiological response occur at the same time: One is not the cause of the other. Both were believed to be the result of cognitive appraisal of the situation.





*The two-factor theory would predict that decaffeinated-coffee drinkers who accidentally drank coffee with caffeine could mistake the resulting physical arousal for an emotion. Could that be happening here?*



*During a break at the Western Psychological Association convention near Vancouver, British Columbia, psychologists Susan Horton and Bob Johnson (one of your authors) reenact the Dutton study of attraction on the Capilano Bridge, where the original study was performed.*

**Two-factor theory** The idea that emotion results from the cognitive appraisal of both physical arousal (Factor #1) and an emotion-provoking stimulus (Factor #2).

Which side was right? It turns out that both had part of the truth. On the one hand, modern neuroscience has confirmed that our physical state can influence our emotions—much as the James–Lange theory argued (LeDoux, 1996). In fact, you may have noted how your own physical state affects your emotions, as when you get edgy feelings after drinking too much coffee or grumpy when hungry. Similarly, psychoactive drugs, such as alcohol or nicotine, can influence the physical condition of our brains and hence alter our moods. These emotional responses arise from circuits deep in the brain responding unconsciously to our physical condition.

Another important new insight comes from the discovery that the brain maintains memories of physical states that are associated with events. These are the “somatic markers” we mentioned earlier (Damasio, 1994; Niedenthal, 2007). When you see the bear on the path in front of you, your brain can quickly conjure a body-memory of the physical response it had previously in a threatening situation. This somatic-marker idea, then, effectively counters Walter Cannon’s objection that physical changes in the body occur too slowly to cause our feelings—because the somatic marker of emotion resides in the brain itself.

On the other hand—and in support of Cannon—emotions can also be aroused by external cues detected either by the conscious or the unconscious emotional system. Thus, emotion can result from conscious thought (as when you fret over an exam) or from unconscious memories (as when you feel disgust at the sight of a food that had once made you sick). Incidentally, cognitive psychologists now believe that depression and phobic reactions can result from conditioned responses of the unconscious emotional system.

**What’s the Role of Cognition in Emotion?** As we noted, you can make yourself emotional just by thinking, as any student with “test anxiety” will testify. The more you think about the dire consequences of failing a test, the more the anxiety builds. “Method” actors, like the late Marlon Brando, have long exploited this fact to make themselves feel real emotions on stage. They do so by recalling an incident from their own experience that produced the emotion they want to portray, such as grief, joy, or anger.

Stanley Schachter’s (1971) **two-factor theory** adds an interesting twist to the role of cognition in emotion. His theory suggests that the emotions we feel depend on our appraisal of both (a) our internal *physical state* and (b) the *external situation* in which we find ourselves. Strange effects occur when these two factors conflict—as they did in the following classic study of emotion, which enterprising students may want to adapt in order to spice up their romantic lives.

An attractive female researcher positioned herself at the end of a footbridge and interviewed unsuspecting males who had just crossed. On one occasion she selected a safe, sturdy bridge; another time, a wobbly suspension bridge across a deep canyon—deliberately selected to elicit physical arousal. The researcher, pretending to be interested in the effects of scenery on creativity, asked the men to write brief stories about a picture. She also invited them to call her if they wanted more information about the study. As predicted, those men who had just crossed the wobbly bridge (and were, presumably, more physically aroused by the experience) wrote stories containing more sexual imagery than those who used the safer structure. And four times as many of them called the female researcher “to get more information”! Apparently, the men who had crossed the shaky bridge interpreted their increased arousal as emotional attraction to the female interviewer (Dutton & Aron, 1974).

Before you rush out to find the love of your life on a wobbly bridge, we must caution you, numerous attempts to test the two-factor theory have produced conflicting results (Leventhal & Tomarken, 1986; Sinclair et al., 1994). So, under what conditions are we most likely to confound physical arousal with emotion? Normally, external events confirm what our biology tells us, without much need for elaborate interpretation—as when you feel disgust at smelling an unpleasant

odor or joy at seeing an old friend. But what happens when we experience physical arousal from not-so-obvious sources, such as exercise, heat, or drugs? Misattribution, it seems, is most likely in a complex environment where many stimuli are competing for our attention, as in the bridge study, above. It is also likely in an environment where we have faulty information about our physical arousal, as when unsuspected caffeine in a soft drink makes us edgy. (See Figure 9.3.)

**Can We Separate Cognition and Emotion?** Some theorists have argued that emotion and cognition are separate and independent brain processes (Izard, 1989, 1993; Zajonc, 1980, 1984). In panic disorder, for example, panic attacks can occur suddenly and without warning—in the absence of a threatening situation and without emotion-provoking thoughts.

An opposing view has been set forth by those who specialize in cognitive psychotherapy. This perspective asserts that cognition and emotion have an intimate connection. Richard Lazarus (1984, 1991a), for example, argues that we can conquer negative emotional responses by changing the way we think about events. In this view, cognition and emotion are components of a single mental system.

Again, insights from neuroscience can help us resolve this conflict. And again, both sides have part of the truth (LeDoux, 1996). Whether emotion and cognition are separate or intertwined depends on which of the two main emotion circuits in the brain is involved. The emotion-and-cognition-are-separate view emphasizes emotions arising in the unconscious emotion systems. In contrast, the emotion-and-cognition-are-connected view emphasizes emotions originating in the conscious emotion pathways.

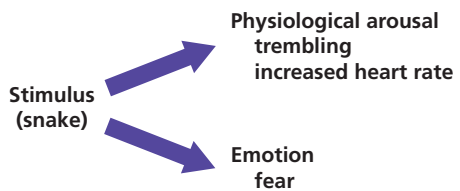
Most recently, Carroll Izard (2007) has proposed a resolution of the issue along similar lines but with different terminology that makes a distinction

**Theories of Emotion Compared**

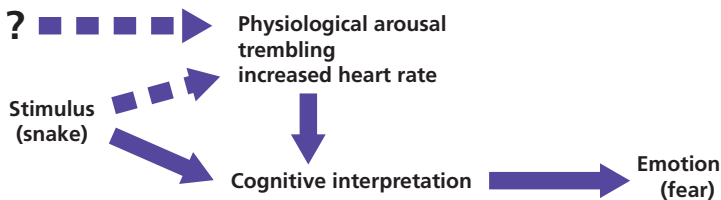
**James–Lange Theory:** Every emotion corresponds to a distinctive pattern of psychological arousal.



**Cannon–Bard Theory:** Emotions arise from a cognitive appraisal of the stimulus. (Offered as an alternative to the James–Lang theory because Canon & Bard believed that emotions often occur too quickly to be the result of psychological arousal, as the James–Lang theory asserted.)



**Schachter's Two-Factor Theory:** Emotions arise from a cognitive interpretation of the stimulus *and* psychological arousal. (But the arousal state is not necessarily a reaction to the stimulus (the snake) to which the person attributes the arousal.)



**FIGURE 9.3**  
Theories of Emotion Compared

between *basic emotions* and *emotional schemas*. He suggests that the *basic emotions* (such as fear, joy, and anger) are driven by deep structures in the primitive brain, while *emotional schemas* (such as, the attachment you feel to your favorite team or your dislike for a certain type of music) involve the cortex. In this view, then, basic emotions are essentially automatic, reflexive responses that rely on brain circuits operating outside of consciousness. By contrast, emotional schemas rely heavily on conscious cognitions.

## PSYCHOLOGY MATTERS

### Arousal, Performance, and the Inverted U

Athletes always want to be “up” for a game—but how far up should they be? Cheering sports fans might think that increased arousal will always improve performance—but that is not necessarily true. Too much arousal can make an athlete “choke” and performance falter. The same is true for you when you take an examination. Up to a point, increasing levels of arousal can motivate you to study, but only slightly higher levels can cause test anxiety and poor performance.

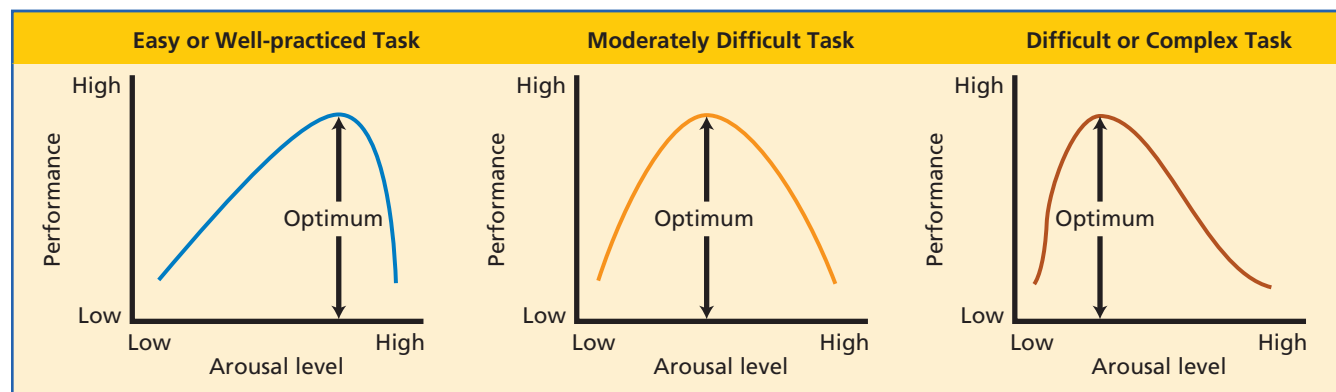
This complex relationship between arousal and behavior has been studied both in laboratory animals and in humans under all sorts of conditions. For example, in experiments on learning, the curve plotting the performance of hungry rats working to get a food reward first rises and then later declines with increasing arousal. The same pattern holds for humans in a variety of circumstances, including athletes under pressure. Psychologists call this the **inverted U function** (so named because the graph resembles an upside-down letter U, as you can see in Figure 9.4). It suggests that either too little or too much arousal can impair performance. Think about it: How much pressure would you want your dentist or surgeon to feel?—which brings us to a second important point.

The optimum amount of arousal varies with the task. As you can see in the figure, it takes more arousal to achieve peak performance on simple tasks or tasks in which responses have been thoroughly rehearsed in advance (as in most sports) than it does on complex tasks or those that require much thinking and planning as the situation develops. So it is not surprising that cheers and high levels of arousal are more likely to boost performance in basketball games than in brain surgery.

Finally, the amount of stimulation needed to produce optimal arousal also varies with the individual. In fact, some people seem to thrive on the thrill of dangerous sports, such as rock climbing and skydiving—activities that would produce immobilizing levels of arousal in most of us. Marvin Zuckerman (2004), who has studied people he calls **sensation seekers**, believes that such individuals

**Inverted U function** A term that describes the relationship between arousal and performance. Both low and high levels of arousal produce lower performance than does a moderate level of arousal.

**Sensation seekers** In Zuckerman’s theory, individuals who have a biological need for higher levels of stimulation than do most other people.



**FIGURE 9.4**  
The Inverted U

Performance varies with arousal level and task difficulty. For easy or well-practiced tasks, a higher level of arousal increases performance effectiveness. However, for difficult or complex tasks, a lower level of arousal is optimal. A moderate level of arousal is generally best for tasks of moderate

- have a biological need for high levels of stimulation. Research suggests that the
- underlying biology involves the brain's dopamine pathways (Bevins, 2001). You
- can test your own sensation-seeking tendencies with Zuckerman's scale, found
- in the "Do It Yourself!" box.

## DO IT YOURSELF!

### Are You a Sensation Seeker?

Different people seem to need different levels of emotional arousal. Marvin Zuckerman argues that "sensation seekers" have an unusually high need for stimulation that produces arousal. In addition to the need for thrills, sensation seekers may be impulsive, engage in risky behaviors, prefer new experiences, and be easily bored (Kohn et al., 1979; Malatesta et al., 1981; Zuckerman, 1974).

From your score on the Sensation Seeking Scale below, you can get a rough idea of your own level of sensation seeking. You may also want to give this scale to some of your friends. Do you suppose that most people choose friends who have sensation-seeking tendencies similar to their own? Wide differences in sensation-seeking tendencies may account for strain on close relationships, when one person is reluctant to take the risks that the other actively seeks.

#### The Sensation-Seeking Scale

Choose A or B for each item, depending on which response better describes your preferences. The scoring key appears at the end.

- A I would like a job that requires a lot of traveling.  
B I would prefer a job in one location.
- A I am invigorated by a brisk, cold day.  
B I can't wait to get indoors on a cold day.
- A I get bored seeing the same old faces.  
B I like the comfortable familiarity of everyday friends.
- A I would prefer living in an ideal society in which everyone is safe, secure, and happy.  
B I would have preferred living in the unsettled days of our history.
- A I sometimes like to do things that are a little frightening.  
B A sensible person avoids activities that are dangerous.
- A I would not like to be hypnotized.  
B I would like to have the experience of being hypnotized.
- A The most important goal of life is to live it to the fullest and experience as much as possible.  
B The most important goal of life is to find peace and happiness.
- A I would like to try parachute jumping.  
B I would never want to try jumping out of a plane, with or without a parachute.
- A I enter cold water gradually, giving myself time to get used to it.  
B I like to dive or jump right into the ocean or a cold pool.
- A When I go on a vacation, I prefer the comfort of a good room and bed.  
B When I go on a vacation, I prefer the change of camping out.
- A I prefer people who are emotionally expressive even if they are a bit unstable.  
B I prefer people who are calm and even tempered.
- A A good painting should shock or jolt the senses.  
B A good painting should give one a feeling of peace and security.
- A People who ride motorcycles must have some kind of unconscious need to hurt themselves.  
B I would like to drive or ride a motorcycle.

**Key** Each of the following answers earns one point: 1A, 2A, 3A, 4B, 5A, 6B, 7A, 8A, 9B, 10B, 11A, 12A, 13B. Compare your point total with the following norms for sensation seeking:

**0-3:** Very low, **4-5:** Low, **6-9:** Average, **10-11:** High, **12-13:** Very high

*Source:* From "The Search for High Sensation" by M. Zuckerman, *Psychology Today*, February 1978. Copyright © 1978 by Sussex Publishers, Inc. Reprinted by permission of Sussex Publishers, Inc.



*Sensation seekers thrive on stimulation that might terrify others.*

## Check Your Understanding

- RECALL:** During emotional arousal, the \_\_\_\_\_ nervous system sends messages to the internal organs.
- APPLICATION:** Give an example of a situation in which a person would be likely to misattribute the source of arousal.
- RECALL:** Briefly describe two issues that have raised controversy among psychologists interested in emotion.
- UNDERSTANDING THE CORE CONCEPT:** Briefly describe the two emotion pathways that neuroscientists have discovered.

**Answers** 1. autonomic 2. The "swinging bridge" study is the classic example, but others include unexpected physical changes that might occur when you are getting sick, becoming overheated or dehydrated, or mistakenly drinking a caffeinated beverage instead of one without caffeine. 3. One issue centers on whether physical arousal is the cause or the effect of emotion. Another is whether we can separate cognition and emotion. 4. The fast pathway produces a near-immediate response and operates mainly at an unconscious level. The slower pathway involves the cerebral cortex and operates largely at the conscious level.



## 9.3 KEY QUESTION

### HOW MUCH CONTROL DO WE HAVE OVER OUR EMOTIONS?



*An Army squad leader needs emotional intelligence to lead people under stressful conditions.*

The ability to deal with emotions is important in many professions. Physicians, nurses, firefighters, and police officers, for example, must be able to comfort others, yet maintain a “professional distance” when dealing with disability and death. But is such emotional control something you are born with—or without? Or can it be learned? Richard Lazarus (1991a,b) has shown that training can help people not only to modify and control their private feelings but also to control the expression of them.

In many situations, aside from work, it can be desirable to mask or modify what you are feeling. If you dislike a professor, you might be wise not to show your true emotions. And if you have strong romantic feelings toward someone—more than he or she realizes—it might be safest to reveal the depth of your feelings gradually, lest you frighten the person away with too much too soon. Similarly, in business negotiations, you will do better if you can prevent yourself from signaling too much emotional arousal. Even in leisure activities like playing poker or planning your next move in chess, you will be most successful if you keep your real feelings, beliefs, and intentions guarded. All of these examples testify that emotional control has an important role in our ability to interact with other people.

In this section, then, we look at the issues involved in emotional control. We begin with the concept of “emotional intelligence,” the ability to modulate your own emotions and to understand and react appropriately to those of others. Then we will look at the other side of emotional control: the detection of deception—which is really a problem in detecting emotional responses that someone is trying to hide. Then, in Psychology Matters, we will examine the control of anger. Here is the Core Concept that ties these topics together:

#### core concept

**Although emotional responses are not always consciously regulated, we can learn to control them.**

The practical, takeaway message from this section is that, while emotions do sometimes slip out of control, we are not simply at their mercy. Emotional understanding and control are skills that can be acquired (Clifton & Myers, 2005).

### Developing Emotional Intelligence

Peter Salovey and John Mayer (1990) have suggested that it takes a certain sort of “smarts” to understand and control one’s emotions. They called it **emotional intelligence**. More recently, Salovey and his colleague Daisy Grewal (2005) have emphasized four components of emotional intelligence:

- *Perceiving emotions.* The ability to detect and decipher emotions in oneself and others
- *Using emotions.* The ability to harness one’s emotions in the service of thinking and problem-solving
- *Understanding emotions.* The ability to comprehend the complex relationships among emotions, such as the relationship between grief and anger or how two people can have different emotional reactions to the same event
- *Managing emotions.* The ability to regulate one’s own emotions and influence those of others

**Emotional intelligence** The ability to understand and control emotional responses.

**The Predictive Power of Emotional Intelligence** Those with high emotional intelligence are not only tuned in to their own emotions and those of others, but they can manage their negative feelings and curtail inappropriate expression of their

impulses. The power of this ability can be seen in the results of the “marshmallow test,” says Daniel Goleman (1995):

Just imagine you’re four years old, and someone makes the following proposal: If you’ll wait until after he runs an errand, you can have two marshmallows for a treat. If you can’t wait until then, you can have only one—but you can have it right now.

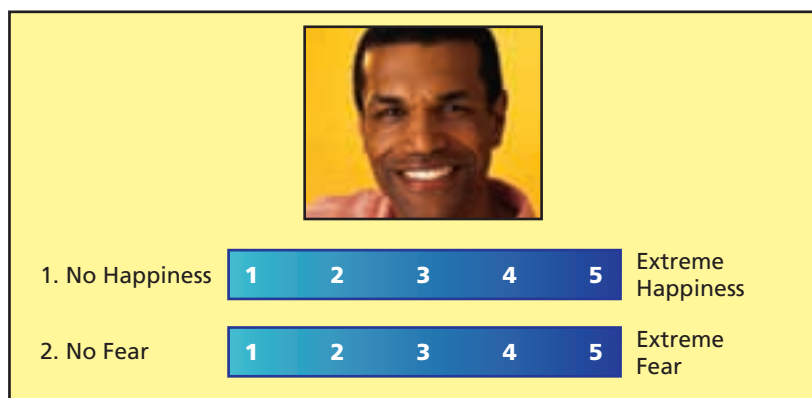
How did the children in this experiment respond to the temptation of the single marshmallow that sat before them, within reach? Goleman continues:

Some four-year-olds were able to wait what must surely have seemed an endless fifteen to twenty minutes for the experimenter to return. To sustain themselves in their struggle they covered their eyes so they wouldn’t have to stare at temptation, or rested their heads in their arms, talked to themselves, sang, played games with their hands and feet, even tried to go to sleep. These plucky preschoolers got the two-marshmallow reward. But others, more impulsive, grabbed the one marshmallow, almost always within seconds of the experimenter’s leaving the room on his “errand.” (pp. 80–81)

When these same children were tracked down in adolescence, the amazing predictive power of the marshmallow test was revealed. As a group, those who had curbed their impulse to grab the single marshmallow were, as adolescents, better off on all counts. They had become more self-reliant, more effective in interpersonal relationships, better students, and better able to handle frustration and stress. By contrast, the children who had given in to temptation had adolescent lives marked by troubled relationships, shyness, stubbornness, and indecisiveness. They also were much more likely to hold low opinions of themselves, to mistrust others, and to be easily provoked by frustrations. In the academic sphere, they were more likely to be uninterested in school. Goleman notes that the marshmallow test also correlated clearly with SAT scores: Those who, as 4-year-olds, were able to delay gratification scored, on the average, 210 points higher than did their counterparts who had grabbed the single marshmallow years earlier.

The usefulness of marshmallow test, of course, is limited to young children. But other, more sophisticated measures have been developed for use with older children and adults. (See Figure 9.5.) The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), for example, predicts satisfaction with social relationships among college students, deviant behavior in male adolescents, marital satisfaction, and success on the job (Salovey & Grewal, 2005).

But, cautions John Mayer (1999), emotional intelligence is not a perfect predictor of success, happiness, and good relationships. Nor should we think of it as a replacement for traditional IQ scores. Rather, says Mayer, emotional intelligence is merely another variable that can help us refine our understanding of behavior.



**FIGURE 9.5**  
Sample Item from a Test of Emotional Intelligence

Shown is an item similar to those found on the Mayer-Salovey-Caruso Emotional Intelligence Test. Respondents are asked to click on the number on each scale that corresponds to the emotional state of the person shown in the photo. (Source: From Salovey & Grewal, “The Science of Emotional Intelligence,” *Current Directions in Psychological Science*, 14, p. 283 © 2005. Reprinted by permission of Blackwell Publishing.)

**CONNECTION • CHAPTER 10**

Extraversion-Introversion is one of the basic Big Five personality dimensions that seem to apply to people all over the world.

**The Nature and Nurture of Emotional Intelligence** Is emotional intelligence a characteristic fixed by heredity, or is it influenced by early experience? Goleman (1995) believes that emotional intelligence, like academic intelligence, can be learned. Based on programs already in place in visionary schools across the country, Goleman has a plan for adding emotional training to the curriculum. The result, he predicts, will bring improved relationships, increased self-respect, and even, perhaps, gains in academic achievement. Not so fast, say Matthew Lieberman and Robert Rosenthal (2001) in an article titled “Why Introverts Can’t Always Tell Who Likes Them.” Lieberman and Rosenthal suggest that emotional intelligence may be just another name for *extraversion*, a personality characteristic that has roots in biology as well as learning. *Introverts*, according to their study, are just not as good at sensing other people’s emotions, especially in settings that require multitasking—and, Lieberman and Rosenthal suggest, perhaps they can never learn to be as sensitive as extraverts. The resolution of this issue remains uncertain at the moment.

Critics also point out that emotional control has a dark side. Just as some people get into trouble when they let their emotions—particular negative emotions—go unchecked, others take emotional control to the opposite extreme. They become so guarded that they never convey affection, humor, or honest displeasure. Studies also show that overcontrolling emotions interferes with memory for emotionally charged events (Carpenter, 2000; Richards & Gross, 2000). Before we launch a program of encouraging emotional control, perhaps we should consider what such training may do to people who already overcontrol their emotions. In fact, research shows that emotionally healthy people know how both to control and to express their emotions—and when it is appropriate to do so (Bonanno et al., 2004).

Finally, we should note that some people have learned to control their emotions for devious purposes. This is the skill practiced by con artists. Their victims are likely to be people who believe that physical or behavioral cues are reliable indicators of people’s private feelings. Let’s turn now to the branch of psychology that studies these deceptive tactics of emotional control.

## Detecting Deception

You might think you can spot deception when someone fails to “look you in the eye” or fidgets nervously. If so, you could be setting yourself up to be duped. Most of us are poor lie detectors—or truth detectors, for that matter. One reason is that social interactions often occur in familiar situations, with people we know and trust, and where we pay little attention to nonverbal cues.

Experts who study deception find that these nonverbal cues are the best signs of deceit: A person who deliberately tries to hoodwink us may “leak” uncontrolled nonverbal signals of deception. Knowing how to read these cues could help you decide whether a huckster is lying to you, your physician might be holding back some bad news, or a politician is shading the truth.

**Deception Cues** The real key to effective deception detection, say the experts, lies in perceiving a person’s behavior over time. Without the chance for repeated observations, you are much less able to judge a person’s honesty (Marsh, 1988). Still, we can offer some pointers for situations in which even a little help in deception detection might be better than none at all (Adelson, 2004; DePaulo et al., 2003):

- Some lies involve giving false information, as when a used-car salesperson is telling you that a junker is in good working order. At such times, the effort to hide the truth requires some cognitive effort. This may result in heightened attention (evident in dilation of the pupils), longer pauses in speech (to choose words carefully), and more constrained movement and gesturing (in an attempt to avoid “giving away” the truth).

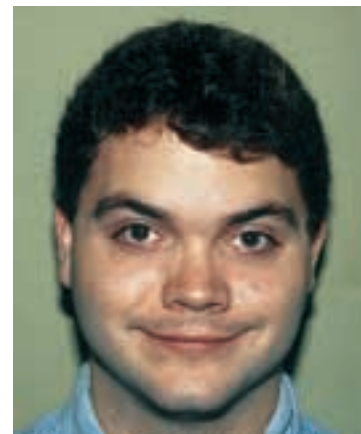
- Criminals sometimes confess to crimes for which there is other specific evidence showing that they are lying to minimize the extent of their involvement in the crime. Analysis of such taped confessions shows that the liar tends to repeat the distorted details of the story (Dingfelder, 2004c).
- When a lie involves hiding one's true feelings of anger or exuberance—as a good poker player does when holding a straight flush—the liar may become physically and behaviorally more aroused. This becomes evident in postural shifts, speech errors, nervous gestures (such as preening by touching or stroking the hair or face), and shrugging (as if to dismiss the lie).
- The face is easier to control than the body, so a deceiver may work on keeping a “poker face” but forget to restrain bodily clues. A smart deception detective might therefore concentrate on a speaker's body movements: Are they rhythmic? Are they calculated? Do the hands move freely or nervously?
- The eyes can sometimes give deceivers away—especially when they're using the common social deception of trying to look happy or amused, when they are not. While our attention may more naturally focus on a smile as an indicator of happiness or amusement, the mouth can be manipulated much more easily than the muscles around the eyes. Only in genuine grins do the eye muscles crinkle up the skin on either side of the eyes. You can test your ability to tell a real from a fake smile in the “Do It Yourself!” box below.
- Speaking of eyes, the ability to “look you straight in the eye” is, in fact, a reasonably good indicator of truth telling—but only when dealing with people who usually tell the truth. When they do lie, their amateurish efforts to deceive often show up in averted gaze, reduced blinking (indicating concentration of attention elsewhere), and less smiling. But you may be fooled by a practiced liar who can look straight at you while telling complete fiction.
- Culture affects the way we distinguish truth from lies. Thus, people are more accurate in telling truth-tellers from liars among people in their own culture. For example, one study found that Jordanians are generally more animated than Americans when talking and that Americans may incorrectly perceive this as “nervousness” and judge the Jordanian to be lying (Bond & Atoum, 2000; Dingfelder, 2004c).

And what about *polygraph* machines—so-called “lie detectors” that are sometimes used by police interrogators and government security agencies? We will take a closer look at these devices in our “Critical Thinking Applied” section at the end of the chapter.

## DO IT YOURSELF! The Eyes Have It

Can you tell if people are sincere when they smile at you? Smiles aren't made just with the mouth, but with the whole face, especially the eyes. A real smile is different from a fake one, primarily around the eyes. Specifically, when we feel genuine joy or mirth, the orbicularis oculi muscles wrinkle up the skin around the eyes.

With this in mind, take a look at these two pictures of smiling faces and see if you can tell which one is the real smile and which one is forced.





## PSYCHOLOGY MATTERS

### Controlling Anger

Anger has a bad reputation because of its association with aggression and violence. But, says anger expert Howard Kassinove, aggression accompanies anger only about 10% of the time (DeAngelis, 2003). And, say psychologists, anger can—if properly controlled—have a positive effect by communicating feelings, helping people stand up for their rights, and clarifying problems in a relationship. Says social psychologist Carol Tavris (1989), “Imagine what the women’s suffrage movement would have been like if women had said, ‘Guys, it’s really so unfair, we’re nice people and we’re human beings too. Won’t you listen to us and give us the vote?’”

Most people feel angry a few times a week and manage to keep their anger in bounds, so the results are usually positive (Kassinove et al., 1997). On the other hand, a small minority go much too far, say anger researchers Raymond Tafrate and his colleagues (2002). Episodes of rage that occur frequently—to the point of being a personality trait—are pathological and need treatment. Likewise, violence that causes harm to someone is never normal or acceptable. That said, however, there is no clinically recognized category for abnormal levels of anger—which can be a problem for clinicians who are trying to bill insurance for helping patients learn to manage their anger.

**Anger Management Therapy** So, what happens in therapy for anger? According to Colorado State University’s Jerry Deffenbacher, the best treatment strategies involve some combination of relaxation training, cognitive therapy, and skill development (J. D. Holloway, 2003a). During therapy, patients practice relaxation techniques until they can quickly put themselves in a relaxed mood during a situation that presses their “anger button,” such as being cut off by another driver on the freeway.

The cognitive component of anger management therapy teaches alternative ways of interpreting situations that would otherwise cause anger. So, the anger-prone motorist might learn to think of rude or dangerous behavior by another driver this way: “There’s an accident waiting to happen, and I don’t want to be part of it.”

The third part of anger therapy—skill development—involves practical applications. For the angry driver, this might mean practicing safe driving techniques, as an alternative to aggressive driving. In this phase, the therapist might shift the treatment setting out of the office and on the road.

“Anger has long been a problem for me,” writes anger management trainer Melvyn Fein. “Over the years it has cost me a great deal of pain and denied me much happiness” (1993, p. ix). Failing at various efforts to control and constructively express his anger, Fein himself became a clinician and developed an approach to anger disorders. Fein’s program, Integrated Anger Management (I.A.M.), adds three more components to Deffenbacher’s list:

1. Learning to express anger safely, so that it will not spin out of control
2. Identifying the underlying source of one’s anger, such as frustration with injustice or the inability to achieve a valued goal
3. Letting go of unrealistic goals that feed the anger, such as the naive belief that expressing anger will motivate others to “do the right thing”

**Dangerous Myths** All the experts agree that the public holds some dangerous myths about anger. On television shows, for example, you can see people attacking and humiliating others, as if the public venting of feelings and the act of revenge will eliminate their anger. In fact, retaliation for a real or imagined wrong is likely to bring only the most fleeting feeling of satisfaction.

- While many people believe that “bottling up” emotions risks an uncontrollable emotional outburst, this belief is at odds with the truth. It is far more likely that venting one’s anger will increase the tendency to become enraged at ever smaller provocations. Solid psychological research indicates that, when you are angry with someone, “getting it off your chest” by aggressively confronting or hurting that individual will not neutralize your bad feelings. Instead it will almost certainly intensify them. It also makes an angry response more likely the next time you face a similar situation. And it invites retaliation by the other party—which is more likely to fuel a feud than to end it. A saner and safer strategy is to keep your feelings to yourself, at least until the passion of your anger has subsided and you can be more rational about the nature of your real complaint and what might be done to solve the problem (Tavris, 1989, 1995). Often, all it takes to defuse a tense and angry situation is to communicate the facts and your feelings to the person toward whom you feel anger.

## Check Your Understanding

1. **RECALL:** What are the four components of emotional intelligence?
2. **APPLICATION:** What telltale behavioral signs might signal that your auto mechanic might be trying to sell you an unnecessary engine overhaul?
3. **ANALYSIS:** Why is it *not* a good idea to deal with anger by “venting” it, as by yelling, throwing things, or hitting the wall?
4. **UNDERSTANDING THE CORE CONCEPT:** Is the ability to control one’s emotional responses the result of nature or nurture?

**Answers** 1. perceiving, using, understanding, and managing emotions 2. Among the signs mentioned in this section: longer pauses in speech, constrained movements, and nervous gestures 3. Venting actually intensifies feelings of anger. Also, it typically does nothing to solve the problem, but instead makes an angry response more likely the next time one faces a threat to pride, status, or honor 4. It is always both, but the important point made in this section is that emotional control can be learned (which is the influence of nurture). Evidence for this comes from studies of emotional intelligence, deception, and anger management therapy.

## 9.4 KEY QUESTION MOTIVATION: WHAT MAKES US ACT AS WE DO?

Why are some people obsessed with food or sex, while others’ passion is to rob banks or go into politics? What drives individuals with anorexia to starve themselves—sometimes to their deaths? Why do some of us feel a need to achieve, while others seek security? Such questions lie in the domain of the psychology of motivation, which deals with the internal processes that cause us to move toward a goal or away from a situation we judge to be unpleasant. As you will remember, we can think of motivation as involving arousal to action. We saw that motivation includes emotions, a special class of motives that are usually aroused by external situations of special importance to us. Other motives, however, are likely to be more focused on internal physical states, as in hunger or thirst, or on mental states, as in the need for achievement or power.

**Motivation**, then, is the general term for all the processes involved in initiating, directing, and maintaining physical and psychological activities. Motivation involves arousal. It also determines which of many possible responses you will select at any moment—although the selection is not always a deliberate, conscious one. Will it be laughing or crying? Fight or flight? Studying or partying? The motivational menu always offers multiple choices. Our Core Concept for this section puts it this way:

**Motivation takes many forms, but all involve mental processes that arouse us and then select and direct our behavior.**

**Motivation** Refers to all the processes involved in initiating, directing, and maintaining physical and psychological activities.

core  
concept

We begin our study of this topic with a look at the many different ways in which we use the concept of motivation.

## How Psychologists Use the Concept of Motivation

Professors may think that students who do poorly on exams are “not well motivated.” Sports commentators speculate that winning teams were “hungrier” or “more motivated” than their opponents. Detectives seek to establish a motive in building a case against a criminal suspect. That is, the public uses the term *motivation* in everyday conversation to refer to a variety of responses that seem to arise from a person’s internal state rather than from the external situation.

Psychologists, too, find the concept of motivation useful in explaining behaviors that cannot be explained by the external situation alone:

- *Motivation connects observable behavior to internal states.* When we see someone eating, we may infer that a hunger drive is at work. We must be careful about drawing such inferences too quickly, though, because eating might be caused by something else that we have overlooked (e.g., social pressure, the availability of a favorite food, or a desire to gain weight).
- *Motivation accounts for variability in behavior.* Psychologists use motivational explanations when the variations in people’s performances are not obviously due to differences in physical or mental abilities or to differing environmental demands. For example, the intensity of motivation may help explain why a basketball player scores well one day but poorly another.
- *Motivation explains perseverance despite adversity.* Motivation helps us understand why organisms continue to perform reliably even under difficult or variable conditions. Motivation gets you to work on time, even when you had a sleepless night or a long commute in the rain.
- *Motives relate biology to behavior.* We are biological organisms with complex internal mechanisms that automatically regulate bodily functions to promote survival. States of deprivation (such as needing nutrients) automatically trigger these mechanisms, which then influence bodily functioning (such as feeling hungry) and create motivational states.

In each of these cases, an internal motivational process channels the organism’s energies into a particular pattern of behavior.

## Types of Motivation

A cat may stalk and kill a mouse because it is hungry, or it may do the same thing purely as feline play (Burghardt, 2006). What is the difference? None, from the mouse’s perspective—but for psychologists it is the difference between a *drive* and a *motive*. Psychologists prefer the term **drive** for motivation that is assumed to respond to a biological need and therefore assumes an important role in survival or reproduction. Hunger and thirst are examples of biological drives. In contrast, many psychologists reserve the term **motive** for urges that, like play, serve no immediate biological need or are strongly rooted in learning, such as the human need for achievement. Obviously, however, many motivated behaviors in humans—such as eating, drinking, and sexual behavior—can stem from both biology and learning.

Psychologists also distinguish between *intrinsic* and *extrinsic* motivation. It’s the difference between reading a book for pleasure and reading a book because you will be tested on it. **Intrinsic motivation** comes from within: That is, the individual engages in an activity for its own sake, in the absence of an external reward. Leisure activities, such as cycling, kayaking, or playing the guitar, are usually intrinsically motivated. Intrinsic motivation arises from inner qual-

### CONNECTION • CHAPTER 10

However, Americans are biased toward ignoring the pressures of the situation. This tendency of attributing behavior to internal motives, is known as the *fundamental attribution error*.

**Drive** Biologically instigated motivation.

**Motive** An internal mechanism that arouses the organism and then selects and directs behavior. The term *motive* is often used in the narrower sense of a motivational process that is learned, rather than biologically based (as are drives).

**Intrinsic motivation** The desire to engage in an activity for its own sake, rather than for some external consequence, such as a reward.

ities, such as personality traits or special interests. In contrast, **extrinsic motivation** comes from the *outside* in the form of rewards and punishments. It involves behavior aimed at some external consequence, such as money, grades, or praise, rather than at satisfying an internal need.

A final distinction contrasts motives and drives that arise from **conscious motivation** with those stemming from **unconscious motivation**. That is, motivated individuals may or may not be aware of the drives or motives underlying their behavior—much as emotional arousal can occur on a conscious or unconscious level. As we will see in a moment, Freud took this idea a step further, suggesting that the unconscious mind harbors complex motives arising from traumatic experiences and sexual conflicts.



*The fact that some people do better in competition than others can be explained in part by different degrees of motivation. These men are participating in the International Games for the Disabled.*

## Theories of Motivation

Unfortunately, psychology has no comprehensive theory that successfully accounts for the whole gamut of human motives and drives. Sex, for example, seems to obey rather different motivational rules from those regulating hunger or thirst or regulation of body temperature, even though all are rooted in biology: You can die from lack of food or warmth but not from lack of sex. Much of the difficulty in explaining diverse types of motivation arises because of our dual nature: We are simultaneously creatures driven by our biology (as when you are ravenous because you haven't eaten all day) and by learning (as when you associate the lunch bell with food).

In the following pages, we will look at several theories of motivation, beginning with *instinct theory*, the grandparent of all modern motivational theories. As we do, please keep in mind the limited domain of each.

**Instinct Theory** According to **instinct theory**, organisms are born with a set of biologically based behaviors, called *instincts*, that generally promote survival. The concept of “instinct” accounts reasonably well for regular cycles of animal activity, seen in essentially the same form across a species, as in salmon that travel thousands of miles to spawn and die in the stream where they were hatched. Although such instinctive behavior patterns do not depend heavily on learning, experience can modify them. We see a combination of instinctive behavior and learning when, for example, bees communicate the location of food to each other, when young salmon learn to distinguish the scent of their native stream, or when birds remember landmarks to guide them in their annual migrations. Such examples, then, show that instincts involve both a lot of nature and a little nurture.

Because it seemed to explain so much, the term *instinct* migrated from the scientific vocabulary to the speech of everyday life. So we speak casually of “maternal instincts,” of an athlete who “instinctively catches the ball,” and of an agent who has an “instinct” for picking new talent. In fact, we use the term in so many ways that its meaning has become vague and imprecise—a mere label, rather than an explanation for behavior. As a result, the term *instinct* has dropped out of favor among scientists (Deckers, 2001). Ethologists, who study animal behavior in natural habitats, now prefer the term **fixed-action patterns**, more narrowly defined as unlearned behavior patterns that occur throughout a species and are triggered by identifiable stimuli. Examples of fixed-action patterns include not only the “instinctive” behaviors described earlier but also such diverse behaviors as nest-building in birds, suckling responses in newborn mammals, and dominance displays in baboons.

Do instincts—perhaps in their new guise as fixed-action patterns—explain any part of human behavior? The question raises the nature–nurture controversy under a new name. Biology *does* seem to account for some human behaviors, such as nursing, that we see in newborns. But it is not clear how useful instinct is in explaining the array of more complex behaviors found in people at work

**Extrinsic motivation** The desire to engage in an activity to achieve an external consequence, such as a reward.

**Conscious motivation** A motive of which one is aware.

**Unconscious motivation** A motive of which one is consciously unaware. Freud's psychoanalytic theory emphasized unconscious motivation.

**Instinct theory** The now-outmoded view that certain behaviors are completely determined by innate factors. The instinct theory was flawed because it overlooked the effects of learning and because it employed instincts merely as labels, rather than as explanations for behavior.

**Fixed-action patterns** Genetically based behaviors, seen across a species, that can be set off by a specific stimulus. The concept of fixed-action patterns has replaced the older notion of instinct.





*According to drive theory, a need for fluids motivates (drives) us to drink. A homeostatic balance is reached when the need is satisfied.*

and play. For example, while we might speculate that the motivation of a hard-driving executive could involve some basic “killer” instinct, such an explanation is weak at best.

**Drive Theory** The concept of *drive* originated as an alternative to instinct for explaining behavior with a strong biological basis, as in eating, drinking, and mating. A drive was defined as the hypothetical state of energy or tension that moves an organism to meet a biological need (Woodworth, 1918). Thus, an animal that needs water is driven to drink. Likewise, a need for food drives organisms to eat. So, in **drive theory**, a biological need produces a drive state that channels behavior toward meeting the need. The drive, then, motivates the animal to act to reduce the drive level, a process called *drive reduction*. You have felt such a buildup and release of tension if you have been extremely cold and then felt driven to find shelter.

According to drive theory, the desirable state that organisms seek is a balanced condition known as **homeostasis** (Hull, 1943, 1952). Organisms that have a biological imbalance (caused, say, by lack of fluids) are driven to seek a homeostatic balance (by drinking). Similarly, we can understand hunger as an imbalance in the body’s energy supply. This imbalance drives an animal that has been deprived of food to eat in order to restore a condition of equilibrium.

Unfortunately for drive theory, the story of motivation has proved not to be that simple—in part because cognitive, social, and cultural forces are at work, as well, as we will see later in our discussion of hunger. In addition, drive theory cannot explain why, in the absence of any apparent deprivation or drives, organisms sometimes act merely to *increase* stimulation. It is hard to imagine a basic need or a biological drive that, for example, could prompt people to jump out of airplanes or propel them up the granite face of Yosemite’s El Capitán. We can even see this issue in the laboratory, where rats will cross an electrified grid merely to reach a novel environment to explore. Apparently, both for people and animals, exploring and taking an interest in the world are rewarding experiences in themselves.

For these reasons, psychologists have concluded that drive theory does not hold all the answers to motivation. Still, they have been reluctant to abandon the concept of drive, which has come to mean a biologically based motive that plays an important role in survival or reproduction. We now look on drive theory as a useful, but incomplete, theory of motivation.

**Cognitive Theory and Locus of Control** Watching TV, reading a book, listening to music, climbing a mountain all owe their motivational push to cognitive processes, rather than to basic drives or instincts. In fact, much of human behavior is motivated by our cognitions—among the most important of which are our *expectations*—which brings us to Julian Rotter’s important concept of *locus of control*.

In his cognitive *social-learning theory* (1954), Rotter (pronounced *ROE-ter*) asserted that the likelihood of a certain behavior (Should I study tonight?) is determined by two factors: (1) the *expectation* of attaining a goal (Will studying get me a good grade?) and (2) the *personal value* of the goal (How much do I care about grades?). But what determines our expectations? Rotter says that they depend largely on our **locus of control**, our beliefs about our ability to control the events in our lives. If, for example, you believe that you can get good grades by studying, you have an *internal locus of control*, and you will behave differently from those students who have an *external locus of control* based on the belief that grades depend on luck or on the teacher’s whims. Rotter’s theory would also predict that people who exercise, save money, or use seat belts have an internal locus of control. On the other hand, the theory also predicts that those who buy lottery tickets or smoke cigarettes have an external locus of control. Such predictions have been supported by thousands of studies that you can find simply by typing “locus of control” into Google or PsychInfo.

**Drive theory** Developed as an alternative to instinct theory, drive theory explains motivation as a process in which a biological *need* produces a *drive*, a state of tension or energy that moves an organism to meet the need. For most drives this process returns the organism to a balanced condition, known as *homeostasis*.

**Need** In drive theory, a need is a biological imbalance (such as dehydration) that threatens survival, if the need is left unmet. Biological needs are believed to produce drives.

**Homeostasis** The body’s tendency to maintain a biologically balanced condition, especially with regard to nutrients, water, and temperature.

**Locus of control** An individual’s sense of whether control over his or her life is internal or external.

**Freud's Psychodynamic Theory** In contrast to all the other views we have considered, Sigmund Freud taught that motivation comes mainly from the murky depths of the unconscious mind, which he called the *id*. There, he said, lurked two basic desires: *eros*, the erotic desire; and *thanatos*, the aggressive or destructive impulse. Virtually everything we do, said Freud, is based on one of these urges or on the maneuvers that the mind uses to keep these desires in check. To avoid mental problems, we must continually seek acceptable outlets for our sexual and aggressive needs. Freud believed that work, especially creative work, indirectly satisfied the sex drive, while aggressive acts like swearing and shouting or playing aggressive games serve as a psychologically safe outlet for our destructive tendencies.

Freud developed his ideas in the heyday of instinct theory, so *eros* and *thanatos* are often thought of as instincts. But it would oversimplify Freud's theory to think of it as just another instinct theory. He wasn't trying to explain the everyday, biologically based behaviors that we find in eating, drinking, mating, nursing, and sleeping. Rather, he was trying to explain the symptoms we find in mental disorders such as phobias or depression.

Modern-day psychologists stand divided on Freud's view of unconscious motivation, a thread that will continue in the next chapter (Bornstein, 2001; Westen, 1998). Aside from introducing you here to Freud's views on motivation, we would like to make one other point. Among the principal theories of motivation discussed in this chapter, Freud's is the only one that takes a *developmental* approach to motivation. That is, Freud theorized about the ways our motives undergo change as we move from childhood to adulthood. With maturity, our sexual and aggressive desires become less conscious. We also develop more and more subtle and sophisticated ways of letting off Freud's two kinds of motivational "steam"—ways that are usually both socially acceptable and acceptable to our conscious minds. (See Table 9.2.)

**Maslow's Humanistic Theory** What happens when you must choose between meeting a biological need and fulfilling a desire based on learning, as when you choose between sleeping and staying up all night to study for an exam? Abraham Maslow (1970) said that you act on your most pressing needs, which occur in a natural *hierarchy* or priority order, with biological needs taking precedence. Unlike the other theories of motivation we have considered, Maslow's perspective attempts to span a wide range of human motivation from biological drives to social motives to creativity (Nicholson, 2007).

Maslow's great innovation was a **hierarchy of needs**: six classes of needs listed in priority order (Figure 9.6). The "higher" needs exert their influence on behavior when the more basic need are satisfied:

- *Biological needs*, such as hunger and thirst, lie at the base of the hierarchy and must be satisfied before higher needs take over.

**Hierarchy of needs** In Maslow's theory, the notion that needs occur in priority order, with the biological needs as the most basic.

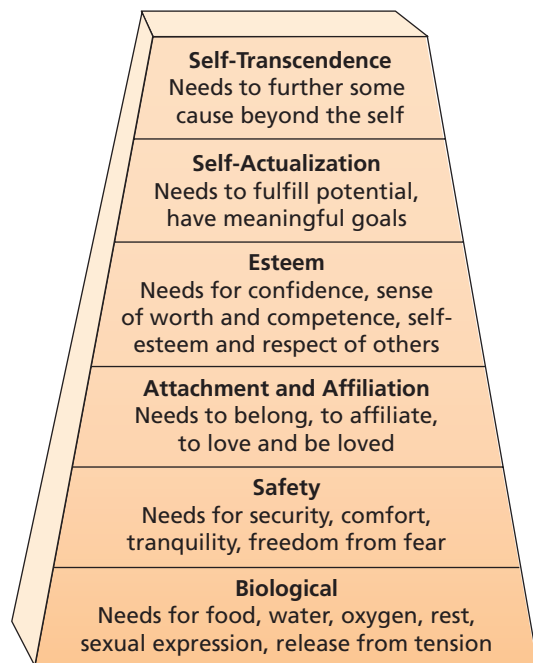
**TABLE 9.2** Theories of Motivation Compared

Theories	Emphasis	Examples
<b>Instinct Theory</b>	Biological processes that motivate behavior patterns specific to a species	bird migration, fish schooling
<b>Drive Theory</b>	Needs produce drives that motivate behavior until drives are reduced	hunger, thirst
<b>Cognitive Theories</b>	Many motives are the result of perception and learning, rather than biology	locus of control, <i>n Ach</i>
<b>Maslow's Theory</b>	Motives result from needs, which occur in a priority order (a needs hierarchy)	esteem needs, self-actualization
<b>Freud's Theory</b>	Motivation arises from unconscious desires; developmental changes in these urges appear as we mature	sex, aggression

- *Safety needs* motivate us to avoid danger, but only when biological needs are reasonably well satisfied. Thus, a hungry animal may risk its physical safety for food until it gets its belly full, and then the safety needs take over.
- *Attachment and affiliation needs* energize us when we are no longer concerned about the more basic drives such as hunger, thirst, and safety. These higher needs make us want to feel we belong, to affiliate with others, to love, and to be loved.
- *Esteem needs*, following next in the hierarchy, include the needs to like oneself, to see oneself as competent and effective, and to do what is necessary to earn the respect of oneself and others.
- *Self-actualization* motivates us to seek the fullest development of our creative human potential. Self-actualizing persons are self-aware, self-accepting, socially responsive, spontaneous, and open to novelty and challenge.
- In his original formulation, Maslow put self-actualization at the peak of the needs hierarchy. But late in his life, Maslow suggested yet another need that he called *self-transcendence*. This he conceptualized as going beyond self-actualization, seeking to further some cause beyond the self (Koltko-Rivera, 2006). Satisfying this need could involve anything from volunteer work to absorption in religion, politics, music, or an intellectual pursuit. What distinguishes self-transcendence from self-actualization is its shift beyond personal pleasure or other egocentric benefits. (You may have noticed the parallel between transcendence and *generativity*, Erikson's mid-life stage of development.)

#### CONNECTION • CHAPTER 6

In Erikson's theory, *generativity* involves making a contribution to family, work, society, or future generations.



**FIGURE 9.6**  
Maslow's Hierarchy of Needs

According to Maslow, needs at the lower level of the hierarchy dominate an individual's motivation as long as those needs are unsatisfied. Once the lower-level needs are adequately satisfied, the higher needs occupy an individual's attention.

How does Maslow's theory square with observation? It explains why we may neglect our friends or our career goals in favor of meeting pressing biological needs signaled by pain, thirst, sleepiness, or sexual desire. Yet—in contradiction to Maslow's theory—people may sometimes neglect their basic biological needs in favor of higher ones, as we saw in rescue workers during the 9/11 attack on New York. But to Maslow's credit, he called our attention to the important role of social motivation in our lives at a time when these motives were being neglected by psychology (Nicholson, 2007). As a result, a great body of work now demonstrates this need we have for relationships with others.

Critics point out that Maslow's theory also fails to explain other important human behaviors: why you might miss a meal when you are absorbed in an interesting book or why sensation seekers would pursue risky interests (such as jumping out of airplanes) that override their safety needs. It also fails to explain the behavior of people who deliberately take their own lives.

Exceptions to Maslow's theory and other "self theories" have also been pointed out by cross-cultural psychologists. They note that an emphasis on self applies primarily to individualistic cultures, which emphasize individual achievement (Gambrel & Cianci, 2003). In contrast, group-oriented (collectivistic) cultures emphasize success of the group (Shiraev & Levy, 2007). In fairness to Maslow, however, we should note that he recognized that there could be cultural differences in motivation (1943). And even the severest critics will acknowledge that, with all its flaws, Maslow's theory was an important step toward a comprehensive theory of motivation.

Overall, Maslow's influence has been greater in the spheres of psychotherapy and education than in motivational research. Business, too, has been especially receptive to Maslow's ideas. Many dollars have been made by consultants using this theory as the basis for seminars on motivating employees. The main idea they

have promoted is that humans have an innate need to grow and actualize their highest potentials. Such an upbeat approach was also welcomed by psychologists who had wearied of the negative emphasis on hunger, thirst, anxiety, and fear in the psychology of motivation (Nicholson, 2007).

## The Unexpected Effects of Rewards on Motivation

It's likely that, at some time or another, you have had to take a test in a subject that didn't interest you. If you were a conscientious student, you learned the material anyway, to get a good grade or, perhaps, to avoid disappointing your parents. As we have noted, psychologists say that such behavior is *extrinsically* motivated because it aims at getting an external reward (or avoiding aversive consequences). Teachers often use grades as extrinsic motivators, hoping to get students more involved in their studies. Extrinsic motivation also explains why people take vitamins, marry for money, pay their taxes, and use deodorant.

But what do you suppose would happen if people were given extrinsic rewards (praise, money, or other incentives) for *intrinsically* motivated behavior—doing things that they already find enjoyable? Would the reward make the activity even more enjoyable? Or less?

**Overjustification** To find out, Mark Lepper and his colleagues (1973) performed a classic experiment, using two groups of school children who enjoyed drawing pictures. One group agreed to draw pictures for a reward certificate, while a control group made drawings without the expectation of reward. Both groups made their drawings enthusiastically. Some days later, however, when given the opportunity to draw pictures again, without a reward, the previously rewarded children were much less enthusiastic about drawing than those who had not been rewarded. In fact, the group that had received no rewards were actually *more* interested in drawing than they had been the first time!

Lepper's group concluded that external reinforcement had squelched the internal motivation in the reward group, an effect they called **overjustification**. As a result of overjustification, they reasoned, the children's motivation had changed from intrinsic to extrinsic. Consequently, the children were less interested in making pictures in the absence of reward.

**A Justification for Rewards** But do rewards *always* have this overjustification effect? If they did, how could we explain the fact that many professionals both love their work and get paid for it? Many subsequent experiments make it clear that rewards interfere with intrinsic motivation only under certain conditions (Covington, 2000; Eisenberger & Cameron, 1996). Specifically, the newer research shows that overjustification occurs when the reward is given *without regard for quality of performance*. In fact, this is just what happened to the children who were all given certificates for their drawings. The same thing can happen in the business world, when employees are given year-end bonuses regardless of the quality of their work.

The lesson is this: Rewards can be used effectively to motivate people—if the rewards are given, not as a bribe, but for a job well done. So, if your child doesn't like to practice the piano, wash the dishes, or do homework, no amount of reward is going to change her attitude. On the other hand, if she enjoys piano practice, you can feel free to give praise, or a special treat, for a job well done. Such rewards can make a motivated person even more motivated. Similarly, if you have disinterested employees, don't bother trying to motivate them with pay raises (unless, of course, the reason they're unmotivated is that you are paying them poorly). But when it is deserved, impromptu praise, an unexpected certificate, or some other small reward may make good employees even better. The danger of rewards seems to occur when the rewards are extrinsic and they are given without regard to the level of performance.

So, how do you think professors should reward their students?



*Overjustification occurs when extrinsic rewards for doing something enjoyable take the intrinsic fun out of the activity. It is likely that this person would not enjoy video games as much if he were paid for playing.*

**Overjustification** The process by which extrinsic (external) rewards can sometimes displace internal motivation, as when a child receives money for playing video games.



## PSYCHOLOGY MATTERS

### Using Psychology to Learn Psychology

The world's greatest achievements in music, art, science, business, and countless other pursuits usually arise from intrinsically motivated people pursuing ideas in which they are deeply interested. People achieve this state of mind when focusing intently on some problem or activity that makes them lose track of time and become oblivious to events around them. Psychologist Mihaly Csikszentmihalyi calls this **flow** (1990, 1998). And although some people turn to drugs or alcohol to experience an artificial flow feeling, he finds that meaningful work produces far more satisfying and more sustained flow experiences.

What is the link with studying and learning? If you find yourself lacking in motivation to learn the material for a particular class, the extrinsic promise of grades may not be enough to prod you to study effectively. You may, however, be able to trick yourself into developing intrinsic motivation and flow by posing this question: What do people who are specialists in this field find interesting? Among other things, the experts are fascinated by an unsolved mystery, a theoretical dispute, or the possibility of an exciting practical application. A psychologist, for example, might wonder: What motivates violent behavior? Or, how can we increase people's motivation to achieve? Once you find such an issue, try to find out what solutions have been proposed. In this way, you will share the mind set of those who are leaders in the field. And—who knows?—perhaps you will become fascinated, too.

## Check Your Understanding

- RECALL:** Give four reasons why psychologists find the concept of *motivation* useful.
- RECALL:** Why has the term *instinct* dropped out of favor with psychologists?
- ANALYSIS:** What is the role of *homeostasis* in drive theory?
- UNDERSTANDING THE CORE CONCEPT:** Motivation takes many forms, but all involve inferred mental processes that select and direct our
  - cognitions.
  - behaviors.
  - sensations.
  - emotions.

**Answers:** 1. The concept of motivation (a) connects observable behavior to internal states, (b) accounts for variability in behavior, (c) explains perseverance despite adversity, and (d) relates biology to behavior. 2. Instinct has become an imprecise term that merely labels behavior, rather than explaining it. 3. Homeostasis refers to the equilibrium condition to which an organism tends to return after reducing a biological drive. 4. b

## 9.5 KEY QUESTION

### HOW ARE ACHIEVEMENT, HUNGER, AND SEX ALIKE? DIFFERENT?

Now that we have reviewed some essential motivational concepts and theories, we will shift our focus to three diverse and important motives: *achievement*, *hunger*, and *sex*. We will see how each of these motives differs from the others, not just in the behavior it produces, but in deeper ways as well. The Core Concept expresses the point:

### core concept

**No single theory accounts for all forms of motivation because each motive involves its own mix of biological, mental, behavioral, and social/cultural influences.**

**Flow** In Csikszentmihalyi's theory, an intense focus on an activity, accompanied by increased creativity and near-ecstatic feelings. Flow involves intrinsic motivation.

Each of the motives to be discussed in this section differs in its blend of nature and nurture. They also differ in their sensitivity to internal and environmental cues, in the reinforcers that satisfy them, and in the social/cultural influences to which they respond. So far, no one—not even Maslow—has been clever enough

to devise a theory that encompasses the whole range of motivations, takes all these factors into account, and still fits the facts.

Recent developments in evolutionary psychology, however, show promise in explaining diverse drives heavily rooted in biology, such as hunger and the sex drive (Buss, 2008, 2001). Evolutionary theory suggests that each motivational mechanism evolved in response to different environmental pressures. Thus, we can think of each motive as a mechanism that adapted to help humans survive and reproduce. We will see, however, that this evolutionary perspective suggests some particularly controversial proposals to explain gender differences.

But even with these tools, we still have no complete and comprehensive theory of motivation. For the moment, then, psychologists must be content with an array of specific theories, each of which explains a different motive. The contrasts between hunger, sex, and achievement will make this point clear.

## Achievement Motivation

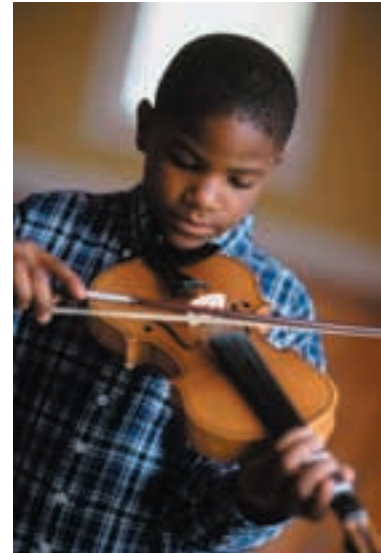
Before you read the caption for Figure 9.7, just look at the picture and imagine what might be happening there. The story you tell yourself about the boy and his violin may reveal some of your dominant motives, especially your *need for achievement*, a psychological motive that accounts for a wide range of behaviors in our culture. Achievement, of course, can be motivated by a desire for recognition, fame, praise, money, or other extrinsic incentives. But, for most of us, there is an intrinsic satisfaction that comes with meeting a challenge and attaining a goal of personal significance. Whatever its source, the need for achievement is an important source of human motivation.

**Measuring the Need for Achievement** Psychologists Henry Murray and David McClelland pioneered the measurement of achievement motivation with an instrument called the *Thematic Apperception Test (TAT)*. On this test, people are asked to tell stories in response to a series of ambiguous pictures, like the one of the boy with the violin in Figure 9.7. Each story, Murray and McClelland theorized, represents a *projection* of the respondent's psychological needs. That is, they assumed that the stories would reflect the themes that were psychologically important for the storyteller. From responses to several of these *TAT* pictures, Murray and McClelland worked out measures of the *need for achievement (n Ach)*, which they saw as the desire to attain a difficult, but desired, goal.

If you haven't already done so, read the caption for Figure 9.7: It gives examples of how a high *n Ach* individual and a low *n Ach* individual might interpret the picture. With these examples in mind, you can judge where your own story fits on a scale from low to high *n Ach*.

What characteristics distinguish people with a high need for achievement? Numerous studies show that those high in *n Ach* work harder and become more successful at their work than those lower in achievement motivation (Schultz & Schultz, 2006). More specifically, people high in *n Ach* show more persistence on difficult tasks than do people with low achievement needs (McClelland, 1987b). In school, those with high *n Ach* tend to get better grades (Raynor, 1970); they also tend to have higher IQ scores (Harris, 2004). In their career paths, they take more competitive jobs (McClelland, 1965), assume more leadership roles, and earn more rapid promotions (Andrews, 1967). If they become entrepreneurs, those with high *n Ach* become more successful than individuals with low *n Ach* (McClelland, 1987a, 1993).

Research also suggests that people can satisfy their need for achievement in two main ways: through *mastery* or *performance* (Barron & Harackiewicz, 2001). We can illustrate these two pathways by imagining two students: The one seeking mastery focuses on acquiring knowledge and developing expert-level skills—getting satisfaction from mastering the material. In contrast, the

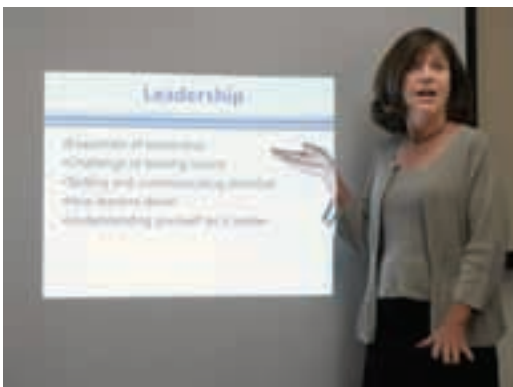


**FIGURE 9.7**  
Alternative Interpretations of a TAT  
Picture

**Story Showing High *n Ach*:** The boy has just finished his violin lesson. He's happy at his progress and is beginning to believe that all his sacrifices have been worthwhile. To become a concert violinist, he will have to give up much of his social life and practice for many hours each day. Although he knows he could make more money by going into his father's business, he is more interested in being a great violinist and giving people joy with his music. He renews his personal commitment to do all it takes to make it.

**Story Showing Low *n Ach*:** The boy is holding his brother's violin and wishing he could play it. But he knows it isn't worth the time, energy, and money for lessons. He feels sorry for his brother, who has given up all the fun things in life to practice, practice, practice. It would be great to wake up one day and be a top-notch musician, but it doesn't happen that way. The reality is boring practice, no fun, and the likelihood that he'll become just another guy playing a musical instrument in a small-town band.

**Need for achievement (*n Ach*)** In Murray and McClelland's theory, a mental state that produces a psychological motive to excel or to reach some goal.



According to McClelland, people have different patterns of motivation for work. Some are motivated by affiliation, some by power, and some by the need for achievement (*n Ach*). A good leader knows how to capitalize on each of these.

performance-oriented student has a competitive focus, satisfying the achievement need by attempting to out-perform other students.

**Organizational Psychology: Putting Achievement Motivation in Perspective** Anyone who has ever held a job knows that not everyone is motivated to work by the need for achievement. People work for money, of course. But beyond that, Industrial/Organizational (I/O) psychologists seek to understand what motivates people to work and to advise managers on ways of encouraging employees to be productive.

David McClelland (1985) identified three distinct motivational patterns, based on people's needs. Some of us are motivated primarily by the *need for affiliation*, some by the *need for power*, and others by the *need for achievement*. The job of the manager (who is probably motivated by achievement or power) is to find ways of structuring work so that people simultaneously meet their dominant needs and the "need" of the employer for productivity.

Should you find yourself in a management position, here are some need-specific pointers:

- Give those high in *n Ach* tasks that challenge them, but with achievable goals. Even though they are not primarily motivated by external rewards, bonuses, praise, and recognition can serve effectively as feedback on performance.
- For those high in power, give them the opportunity to manage projects or work teams. You can encourage power-oriented workers to become leaders who help their subordinates satisfy their own needs. Although power motivation can be purely self-serving, don't fall into the trap of thinking that the need for power is necessarily bad.
- A cooperative, rather than competitive, environment is best for those high in the need for affiliation. Find opportunities for them to work with others in teams, rather than at socially isolated work stations.

Satisfying people's needs should make them happier and more motivated to work. But does job satisfaction actually lead to increased productivity? Indeed, job satisfaction is the most frequently studied variable by I/O psychologists. And the result is as we might expect: Higher job satisfaction correlates with lower absenteeism, lower employee turnover, better performance, and increased productivity—all of which are reflected in increased profits (Schultz & Schultz, 2006).

**A Cross-Cultural Perspective on Achievement** When she won the Olympic gold medal in the women's 200-meter butterfly, American swimmer Misty Hyman said:

I think I just stayed focused. It was time to show the world what I could do. I am just glad I was able to do it. I knew I could beat Suzy O'Neil, deep down in my heart I believed it, and I know this whole week the doubts kept creeping in, they were with me on the blocks, but I just said, "No, this is my night." (Neal, 2000)

Contrast that with Naoko Takahashi's explanation of why she won the women's marathon:

Here is the best coach in the world, the best manager in the world, and all of the people who support me—all of these things were getting together and became a gold medal. So I think I didn't get it alone, not only by myself. (Yamamoto, 2000)

As you can see from these distinctively different quotes, the American perspective on achievement motivation reflects a distinctively Western bias. We

Americans tend to see achievement as the result of individual talent, determination, intelligence, or attitude. Much of the world, however, sees achievement differently—in a broader context, as a combination of personal, social, and emotional factors (Markus et al., 2006).

This observation is consistent with Harry Triandis's distinction between cultures that emphasize *individualism* or *collectivism* (1990). Western cultures, including the United States, Canada, Britain, and Western Europe, emphasize **individualism**. People growing up in these cultures learn to place a high premium on individual performance. By contrast, says Triandis, the cultures of Latin America, Asia, Africa, and the Middle East often emphasize **collectivism**, which values group loyalty and subordination of self to the group. Even in the collectivist cultures of Japan, Hong Kong, and South Korea, where very high values are placed on doing well in school and business, the overarching goal is not of achieving individual honors but of bringing honor to the family, team, or other group.

Without a cross-cultural perspective, it would be easy for Americans to jump to the erroneous conclusion that motivation for individual achievement is a “natural” part of the human makeup. But Triandis's insight suggests that this is not true in many parts of the world. (See Table 9.3.) Instead, in collectivist cultures the social context is just as important for achievement as are talent, intelligence, or other personal characteristics in individualistic cultures.

## Hunger Motivation

You will probably survive if you don't care about achievement, but you will die if you don't eat. Unlike achievement motivation, hunger is one of our biological maintenance and survival mechanisms (Rozin, 1996). And if eating were a behavior that had to be entirely learned, many people would starve to death before they mastered its complexities. Instead, when food is available and we are hungry, eating seems to come naturally. But biology isn't the whole story: Hunger motivation and eating behavior have turned out to be far more complex than had originally been thought. So psychologists now incorporate the complexities of hunger and eating into a view we will call the *multiple-systems approach*. (See Figure 9.8.)

**The Multiple-Systems Approach to Hunger** Your brain combines hunger-related information of many kinds: your body's energy requirements and nutritional state, your food preferences, food cues in your environment, and cultural demands. For example, your readiness to eat a slice of bacon depends on factors such as your blood sugar level, how long it has been since you last ate, whether

**Individualism** The view, common in the Euro-American world, that places a high value on individual achievement and distinction.

**Collectivism** The view, common in Asia, Africa, Latin America, and the Middle East, that values group loyalty and pride over individual distinction.

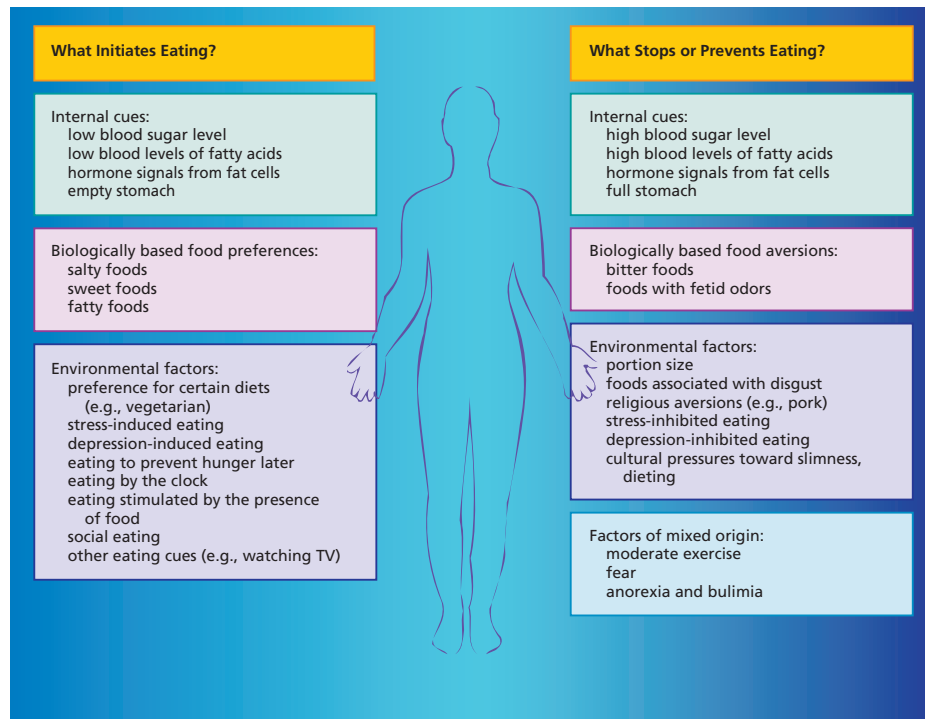
**TABLE 9.3** A Comparison of Three Motives

Motive	Distinguishing features
<b>Achievement</b>	A psychological motive; operates mainly at a conscious level Affected by learning, especially the culture's emphasis on individualism or collectivism
<b>Hunger</b>	A homeostatic biological drive, but also influenced by learning A deficiency motive; aroused by deprivation May involve unconscious processes
<b>Sex</b>	A biological drive, but not homeostatic; also influenced by learning Not primarily a deficiency motive May involve unconscious processes



**FIGURE 9.8**  
**Multiple-Systems Model of Hunger and Eating**

Hunger isn't just a matter of an empty stomach. The multiple-systems model combines all the known influences on hunger and eating.



you like bacon, what time of day it is (breakfast?), whether a friend might be offering you a slice, and whether bacon is an acceptable food in your culture. Assembling all these data, the brain sends signals to neural, hormonal, organ, and muscle systems to start or stop food-seeking and eating (DeAngelis, 2004b; Flier & Maratos-Flier, 2007).

**Biological Factors Affecting Hunger and Eating** In the brain, the stomach, the blood, and in fat cells stored all over the body a host of biological factors is at work to regulate hunger and eating behavior. Among the most important are these:

- **Brain mechanisms controlling hunger.** For nearly 70 years, physiologists thought they had the brain mechanisms of hunger figured out: One part of the hypothalamus produced hunger, while another dampened hunger. Gradually, however, research has shown that the picture is much more complicated—which explains why hunger and obesity are so difficult to control. True, the hypothalamus has a central role in hunger, but so do other brain regions, particularly in the brain stem. These circuits monitor the status of blood sugar, fat and other energy stores, and nutrients in the gut, using a suite of hormones and other chemical messengers (Flier, 2006).
- **Set point (homeostatic) mechanisms.** An internal biological “scale” continually weighs the body’s fat stores and informs the central nervous system of the result. Whenever deposits stored in specialized fat cells fall below a certain level, or **set point**, signals trigger eating behavior—a homeostatic process. In fact, research suggests that one cause of obesity may involve problems with certain chemicals (e.g., the hormone *ghrelin*) that signal hunger and others (e.g., *leptin*) that signal when the set point has been reached. Animals lacking leptin, for example, continue to eat even when not hungry (Grimm, 2007).
- **Sensors in the stomach.** Pressure detectors in the stomach signal fullness or a feeling of emptiness. These messages are sent to the brain, where they combine with information about blood nutrients and the status of the body’s fat cells.
- **Reward system preferences.** The brain’s reward system gives us preferences for sweet and high-fat foods. These preferences have a biological basis that

**Set point** Refers to the tendency of the body to maintain a certain level of body fat and body weight.

evolved to steer our ancestors toward the calorie-dense foods that enabled them to survive when food supplies were unpredictable. This tendency has been exploited in modern times by the manufacturers of sweet and fatty snack foods.

- **Exercise.** Physical activity also contributes to hunger and satiation. Extreme exercise provokes hunger, but studies show that moderate exercise actually suppresses appetite (Hill & Peters, 1998).

These hunger mechanisms usually work in concert to keep fat stores and body weight within a narrow range, specified by the biological set point. Still, the set point doesn't always keep weight in a desirable range, as we shall see.

**Psychological Factors Affecting Hunger and Eating** In addition to the biological mechanisms that regulate eating, our emotional state can encourage or discourage eating. For example, both humans and animals refrain from eating when they are fearful. Stress and depression can also affect appetite, although the effects are variable: Some people respond by eating more, and some by eating less.

Learning plays a role, too. Because we also associate certain situations with eating, we can feel hungry regardless of our biological needs. This explains why you may suddenly want to eat when you notice that the clock says lunch time. It also explains why you snack while watching TV or dish up a second helping at Thanksgiving dinner.

Likewise, culture can influence hunger and eating. This can be seen in societies, such as the United States, where social norms among teenage girls promote thinness. On the other hand, in Oceania, where larger figures are often considered more attractive, the social norms promote heftier bodies (Newman, 2004).

While the ideal promoted in movies, magazines, and on TV is one of thinness, Americans receive a different message from commercials that encourage eating. The result is a growing obesity problem in a population obsessed with weight. Moreover, as the influence of U.S. culture becomes more global, American eating habits have become more universal, with the result that calorie-dense snacks and fast foods are making people fatter all over the world (Hébert, 2005; Popkin, 2007).

Recently, the media splashed across the front pages and TV screens of the nation the news that obesity is “socially contagious.” But, contrary to the ensuing hype, you can't “catch” obesity from a friend or relative or coworker. What the report by Nicholas Christakis and James Fowler (2007) actually said was that people influence each other with their eating habits. So people align their expectations about food and eating to those of their friends and family members. It just goes to show that eating is based on culture as much as it is on biology.

**Eating Disorders** When a person weighs less than 85% of the desirable weight and still worries about being fat, the likely diagnosis is *anorexia nervosa*. This condition may also be accompanied by *bulimia nervosa*, characterized by periods of binge eating followed by purging measures, which may include vomiting, fasting, or using laxatives. In the United States, these disorders are estimated to occur about ten times as often in females as in males, with the greatest risk being in adolescent girls and young women.

Significantly, such eating disorders seem to be most prevalent in Western cultures in which hunger is not uncommon. They are especially likely to develop among middle- and upper-middle-class young women.

**Anorexia Nervosa** Technically, the condition called *anorexia* (persistent lack of appetite) may develop as a consequence of certain physical diseases or conditions, such as shock, nausea, or allergic reactions. However, when loss of appetite that



*In the global economy, calorie-dense fast foods have become readily available, changing dietary habits and contributing to a worldwide epidemic of obesity.*

**CONNECTION • CHAPTER 12**

People with obsessive compulsive disorder have persistent and intrusive thoughts and also feel compelled to act out ritual behaviors.

endangers an individual's health stems from emotional or psychological causes, the syndrome is called **anorexia nervosa** ("nervous anorexia"). A person suffering from anorexia nervosa may act as though she is unconcerned with her condition, although she is emaciated. Anorexia nervosa sufferers not only become dangerously thin, their health suffers in other ways, including cessation of menstruation, osteoporosis, bone fractures, and shrinkage of brain tissue. Over time, "purging" (vomiting to rid oneself of food one has eaten) results in stomach acid damaging the esophagus and throat, as well as the teeth. Psychologically, anorexia nervosa victims may be clinically depressed or show signs of obsessive-compulsive disorder. The condition is associated with extreme dieting—so extreme, in fact, that anorexia nervosa posts the highest mortality rate of any recognized mental disorder (Agras et al., 2004).

What causes anorexia? (We will shorten the term in conformity with common usage.) A strong hint comes from the finding that most persons with anorexia are young females. They may have backgrounds of good behavior and academic success, but they starve themselves, hoping to become acceptably thin and attractive (Keel & Klump, 2003). While cultural ideals of feminine beauty change over time, in recent decades the mass media—including fashion magazines and MTV—have promoted extremely slim models and celebrities. Especially during adolescence, when people tend to evaluate themselves in terms of physical attractiveness, they judge themselves harshly for failing to live up to cultural ideals. A victim of anorexia typically holds a distorted body image, believing herself to be unattractively fat, and rejects others' reassurances that she is not overweight (Bruch, 1978; Fallon & Rozin, 1985). In an effort to lose imagined "excess" weight, the person with anorexia rigidly suppresses her appetite, feeling rewarded for such self-control when she does lose pounds and inches—but never feeling quite thin enough. (See Figure 9.9.)

Recent work on anorexia and bulimia has questioned the assumption that social pressures play the dominant role—focusing instead on possible genetic factors (Grice et al., 2002; Kaye et al., 2004). This makes sense from an evolutionary standpoint, says clinical psychologist Shan Guisinger (2003). She points out the hyperactivity often seen in individuals with anorexia—as opposed to the lethargy common in most starving persons—suggesting that hyperactivity under conditions of starvation may have been an advantage that motivated the ancestors of modern-day individuals with anorexia to leave famine-impo- verished environments.

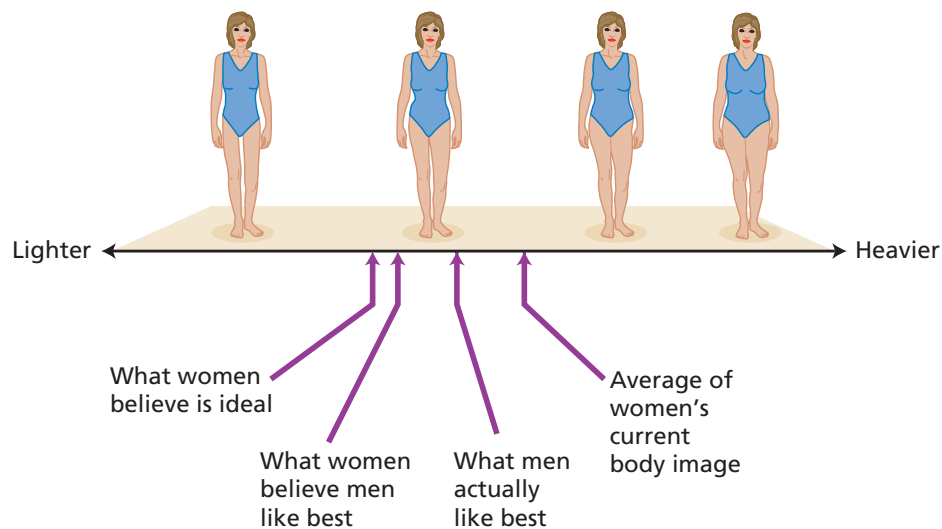
**Bulimia** In the "binge-and-purge" syndrome known as **bulimia nervosa** (usually just called *bulimia*), the sufferer overeats (binges) and then attempts to lose weight (purges) by means of self-induced vomiting, laxative use, or fasting (Rand & Kulda, 1992). Those who suffer from bulimia usually keep their disorder inconspicuous and may even be supported in their behavior patterns by peers and by competitive norms in their academic, social, and athletic lives (Polivy & Herman, 1993).

Eating disorders are commonly associated with other forms of psychopathology. For example, bulimia nervosa is a predictor of depression (Walters et al., 1992). Further, individuals with anorexia and bulimia apparently take little joy in their thinner profiles, even though their original rationale might have been to lose weight. And, while hungry normal people look forward to eating and enjoying a good meal, individuals who have eating disorders do not associate pleasure with food and may even dread having to eat. Corroborating this observation, patients with bulimia in one study took longer to begin eating a scheduled meal, ate more slowly, and reported significantly more negative moods during eating than did individuals without bulimia (Hetherington et al., 1993).

Cognitive explanations for eating disorders analyze how the individual sees herself and thinks about food, eating, and weight. Accordingly, many treatments for eating disorders employ strategies that alter self-perception and boost feelings of self-efficacy (Baell & Wertheim, 1992).

**Anorexia nervosa** An eating disorder involving persistent loss of appetite that endangers an individual's health and stemming from emotional or psychological reasons rather than from organic causes.

**Bulimia nervosa** An eating disorder characterized by eating binges followed by "purges," induced by vomiting or laxatives; typically initiated as a weight-control measure.



**FIGURE 9.9**  
Women's Body Images

April Fallon and Paul Rozin (1985) asked female college students to give their current weight, their ideal weight, and the weight they believed men would consider ideal. The results show that the average woman felt that her current weight was significantly higher than her ideal weight—and higher than the weight she thought men would like. To make matters worse, women also see their bodies as looking larger than they actually are (Thompson, 1986). When men were asked to rate themselves on a similar questionnaire, Fallon and Rozin found no such discrepancies between ideal and actual weights. But, when asked what they saw as the ideal weight for women, they chose a higher weight than women did. No wonder women go on diets more often than men and are more likely to have a major eating disorder (Mintz & Betz, 1986; Striegel-Moore et al., 1993).

**Obesity and Weight Control** At the other extreme of weight control, the problem of obesity has grown at an alarming rate since the early 1980s, with the result that 65% of Americans are overweight, and 30% are now classified as obese (DeAngelis, 2004b). The real problem, of course, is not obesity but the associated health risks for such problems as heart disease, stroke, and diabetes—although experts disagree on just how much of a problem this is among the merely overweight (Couzin, 2005; Gibbs, 2005). Unfortunately, the fundamental causes of this obesity epidemic are complex and poorly understood (Doyle, 2006).

No one in the field of obesity research believes that the condition results from the lack of “will power”—a simplistic and scientifically useless concept (Friedman, 2003). Rather, most experts believe that obesity results from such factors as poor diet (including super-size portions and an increasing amount of “junk food”) and a spate of biological factors, including genetics (DeAngelis, 2004a; Flier & Maratos-Flier, 2007). Research also shows that lack of exercise plays a major part. For example, the long-term Nurses' Health Study showed that every two-hour increase in daily TV-watching translated into a 23% increase in obesity (Hu et al., 2003). Other research has shown that lean individuals are not only more active than obese individuals, they also fidget more when they are sitting (Levine et al., 2005; Ravussin, 2005). Finally, one study suggests that running a sleep debt may trigger eating and a resulting weight gain, perhaps because the body mistakes sleepiness for hunger (Hasler et al., 2004).

From an evolutionary viewpoint, humans are Stone Age creatures biologically adapted to deal with periods of feast and famine. So, we tend to eat more than we need when food is abundant, as a hedge against future periods of starvation. Unfortunately, this Stone-Age strategy is not well suited to life in a modern world—where most people in developed countries also have no need to expend energy running down game or digging roots. Nor are we well suited for a world of French fries, milkshakes, candy bars, and nachos, which appeal to our deeply ingrained tastes for salty, fatty, and sweet foods—which just happen to be rich in calories (Pinel et al., 2000). In many respects, the typical school or office bears far less resemblance to the environment in which humans evolved than it does to feedlots, where animals are fattened with abundant food and little opportunity for exercise.

The problem is not lack of concern. Americans, especially, seem obsessed by weight and weight loss, as a glance at the magazine headlines on the newsstand will show. At any given time, one-third of adult Americans say that they are on some sort of weight-control diet (Gibbs, 1996).



Yet, despite all we know about hunger and weight control, no one has yet discovered a weight-loss scheme that really works. Notwithstanding nationally advertised claims, no diet, surgical procedure, drug, or other weight-loss gimmick has ever produced long-term weight loss for a majority of the people who have tried it. At this point, the best odds for most people lie in cognitive-behavioral therapies (Institute of Medicine, 2002; Rich, 2004). And for those struggling with weight, it is encouraging to know that some potentially effective weight-control chemicals are being tested as you read this, although it may be several years before any come to market (Flier & Maratos-Flier, 2007). In the meantime, the experts suggest that the best pathway to long-term weight control involves maintaining a well-balanced diet, a program of moderate exercise, and, if you want some extra help, cognitive-behavioral therapy.

## Sexual Motivation



*Our cultural lessons and life experiences influence the meaning of sex in our lives.*

You may have noticed that sex is a most unusual biological drive. Unlike hunger or thirst, arousal of the sex drive can be pleasurable. Even so, sexually aroused individuals typically seek to reduce the tension with sexual activity. And again unlike hunger and thirst, sex is not homeostatic, because it does not return the body to an equilibrium condition. Moreover, sexual motivation can serve diverse goals, including pleasure, reproduction, and social bonding.

In one respect, sexual motivation does have a kinship with hunger and thirst: It has its roots in survival. But even in this respect, sex is unique among biological drives because lack of sex poses no threat to the individual's survival. We can't live for long without food or water, but some people live their lives without sexual activity (although some would say that that's not really living!). Sexual motivation involves the survival of the species, not the individual.

All the biological drives—sex included—exert such powerful influences on behavior that they have led to numerous social constraints and taboos, such as prohibitions on eating certain meats or drinking alcohol. In the realm of sexuality, we find extensive culture-specific rules and sanctions involving a wide variety of sexual practices. In fact, all societies regulate sexual activity, but the restrictions vary widely. For example, homosexuality has been historically suppressed in American and Arab cultures, but it is widely accepted in Polynesian societies. Rules about marriage among relatives also varies from culture to culture.

Even the discussion of sex can become mired in taboo, misinformation, and embarrassment. Scientists who study human sexuality have felt intense social and political pressures, which show no signs of abating in the present. The result is that the scientific understanding of sexuality, which we will survey below, has been hard won.

**The Scientific Study of Sexuality** The first major scientific study of human sexuality was initiated by Alfred Kinsey and his colleagues (1948, 1953) in the mid-20th century, with interviews of some 17,000 Americans concerning their sexual behavior. To a generally shocked public, these researchers revealed that certain behaviors (oral sex, for example) previously considered rare, and even abnormal, were actually quite widespread. While Kinsey's data are now over 50 years old, his interviews continue to be considered an important source of information about human sexual behavior, especially since no one else has interviewed such a large and varied sample.

In the 1990s, another large survey of American sexuality was described in *The Social Organization of Sexuality: Sexual Practices in the United States* (Laumann et al., 1994) and in a smaller, more readable companion volume called *Sex in America* (Michael et al., 1994). (See Table 9.4.) This project, known as the National Health and Social Life Survey (NHSLs), involved interviews of 3432 adults, ages 18 to 59. While there were some built-in sources of bias (for

**TABLE 9.4 Sexual Preferences and Behaviors of Adult Americans**

Frequency of intercourse	Not at all	A few times per year		A few times per month	Two or more times per week	
Percentage of men	14	16		37	34	
Percentage of women	10	18		36	37	
Number of sexual partners since age 18	0	1	2–4	5–10	10–20	21+
Percentage of men	3	20	21	23	16	17
Percentage of women	3	31	31	20	6	3
Infidelity while married						
Men	15.1%					
Women	2.7%					
Sexual orientation	Males	Females				
Heterosexual	96.9	98.6				
Homosexual	2.0	.9				
Bisexual	.8	.5				

Source: Adapted from Michael et al., 1994. Table based on survey of 3432 scientifically selected adult respondents.

example, only English-speaking persons were interviewed), the NHLS managed to get a remarkable response rate: Of those recruited for the survey, 79% agreed to participate. When melded with other surveys taken since Kinsey's time, this study showed, among other things, a marked increase in the percentage of youth who are sexually active, along with a declining age at first intercourse (Wells & Twenge, 2005). A smaller but more recent survey, however, shows that the percentage of teens who say they are virgins has increased slightly in the last decade (Doyle, 2007).

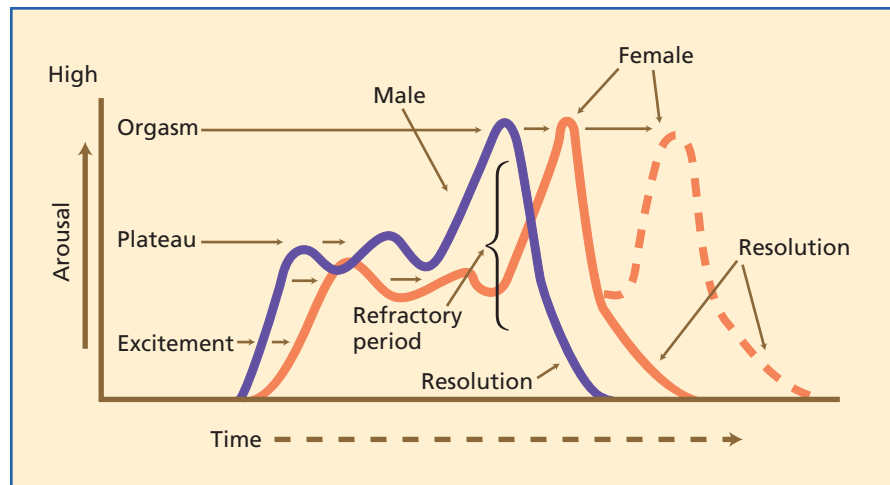
But virginity is not controlled solely by social pressures. In a study comparing identical twins with fraternal twins, researchers have found that the age at which individuals first have sex is strongly influenced by genetics (Weiss, 2007). Because the same work also showed a genetic influence on the tendency to get in trouble with the law, the scientists speculate that the underlying factor may be a risk-taking tendency—which could be the same one that we saw earlier in Zuckerman's research on sensation seeking.

**Masters and Johnson: Gender Similarities and the Physiology of Sex** While it was Kinsey who first shocked the nation's sensibilities with sexual science, it was William Masters and Virginia Johnson (1966, 1970, 1979) who really broke with tradition and taboo by bringing sex into their laboratory. There they studied sex by directly observing and recording the physiological patterns of people engaging in sexual activity of various types, including masturbation and intercourse. By doing observational studies, they discovered not what people *said* about sex (which carries obvious problems of response bias: People are not always willing to give completely honest answers to very personal questions), but Masters and Johnson discovered how people actually *reacted physically* during sex. In the wake of their daring departure from tradition, the study of human sexual behavior has become much more accepted as a legitimate field of scientific inquiry.

**FIGURE 9.10**  
**The Sexual Response Cycle**

Note that the phases of sexual response in males and females have similar patterns. The primary differences are in the time it takes for males and females to reach each phase and in the greater likelihood that females will achieve multiple orgasms.

(Source: From J. H. Gagnon, *Human Sexualities*, © 1977. Reprinted by permission of J. H. Gagnon.)



Based on their observations, Masters and Johnson identified four phases of human sexual responding, which they collectively called the **sexual response cycle**. (See Figure 9.10.) These are the distinguishing events of each phase:

- In the *excitement phase*, blood vessel changes in the pelvic region cause the clitoris to swell and the penis to become erect. Blood and other fluids also become congested in the testicles and vagina.
- During the *plateau phase*, a maximal level of arousal is reached. Rapid increases occur in heartbeat, respiration, blood pressure, glandular secretions, and muscle tension.
- When they reach the *orgasm phase*, males and females experience a very intense and pleasurable sense of release from the cumulative sexual tension. Orgasm, characterized by rhythmic genital contractions, culminates in ejaculation of semen in men and clitoral and vaginal sensations in women.
- During the *resolution phase*, the body gradually returns to its preexcitement state, as fluids dissipate from the sex organs. At the same time, blood pressure and heart rate, which had increased dramatically, drop to their customary levels. Note how similar men's and women's physical responses are at each phase of the cycle.

Note also that Masters and Johnson focused on physiological arousal and responses. Accordingly, they paid relatively little attention to psychological aspects of sexuality—for example, emotional responses, sexual desire, or the motivation to seek out a partner or make oneself available for sexual experience. Still, from their biological observations of subjects' sexual behavior, Masters and Johnson drew several newsworthy conclusions:

- Men and women have remarkably similar patterns of biological response, regardless of the source of sexual arousal—whether it be intercourse or masturbation. This is clearly seen in the four phases of the sexual response cycle.
- Although the phases of the sexual response cycle are similar in the two sexes, women tend to respond more slowly but often remain aroused longer.
- Many women can have multiple orgasms in a short time period, while men rarely do.
- Size of the genitals or other physical sex characteristics (such as vagina, breasts, penis) is generally unrelated to any aspect of sexual performance (except, perhaps, attitudes about one's sexual capability).

**Sexual response cycle** The four-stage sequence of arousal, plateau, orgasm, and resolution occurring in both men and women.

Most important, perhaps, Masters and Johnson used their discoveries about sexual behavior to develop effective behavioral therapies for a variety of sexual disorders, including male erectile disorder (inability to achieve or maintain an erection), premature ejaculation, and female orgasmic disorder.

**But How Do Men and Women Differ in Their Sexuality?** While Masters and Johnson called our attention to the similarities between men and women in the sexual response cycle, Ann Peplau (2003) points out four crucial differences. First, she notes, *men show more interest in sex than do women*—on the average, of course. Men not only think about sex more often, but they are more likely to attend to visual sexual stimuli; they also prefer to have sex more frequently than do women.

Second, *women are more likely than men to view sex in the context of a committed relationship*. That is, says Peplau, women are more likely to “romanticize” sexual desire as a longing for emotional intimacy, while men tend to see sex more as physical pleasure. As a result, women (both heterosexual and lesbian women, incidentally) generally have a less permissive attitude toward casual sex than do men (including both gay and straight men).

Third, *sex is more likely to be linked with aggression for males than for females*. As you probably know, rape is almost exclusively an act committed by males. But even in milder forms, aggression is more a male than a female characteristic. For example, men are more likely to be domineering or abusive in a sexual relationship. (We should add that, even though these gender differences seem to have a biological basis, nothing in this fact excuses hurtful or forced sexual behavior.)

Fourth, Peplau argues that *women’s sexuality has greater “plasticity.”* By that she means that women’s behaviors and beliefs are more readily shaped by cultural and social factors, as well as by the immediate situation. For example, women’s sexual activity over time is far more variable in its frequency than men’s. This is especially true when circumstances change, as in a divorce. Cultural factors, such as religion and cultural norms, also influence women’s sexuality more than men’s. Especially interesting is the fact that higher education is, for both men and women, correlated with more liberal sexual attitudes—but the effect is much stronger for women.

**Sexual Cues** What turns you on depends not only on your gender but also on learning. While the sequence of sexual activities that may lead to orgasm can begin with a single unconditioned stimulus—often a touch—it most likely will be accompanied by a variety of conditioned stimuli, such as sights, sounds, and smells. In the form of genital caresses, touch is a universal component of sexual foreplay (Ford & Beach, 1951). Virtually any stimulus that becomes associated with genital touch and orgasm can become a conditioned stimulus that motivates sexual activity—whether the stimulus is present physically or only in memory or fantasy.

Visual stimuli can also be arousing to both men and women (Murnen & Stockton, 1997). Exactly what a person finds sexually stimulating, however, is often determined by stimuli associated with sex (such as chocolate, perfume, or erotic pictures) and sexual fantasies experienced during masturbation (Storms, 1980, 1981). Inanimate objects, textures, sounds, visual images, odors—any tangible or imagined stimulus—can become the focus of arousal through this conditioned association. For reasons that are poorly understood, some people learn to become aroused only by specific stimuli, such as pain or the sight of undergarments.

**Sexual Scripts** Generalized sexual arousal can be channeled into specific behaviors (such as kissing or masturbation) that depend on how the individual has been conditioned to think about sexual matters—particularly about **sexual scripts**, which are socially learned programs of sexual interpretation and responsiveness.

How do you know how you are “supposed” to feel when aroused? What do you do when you feel that way? Your culture provides you with many clues from which you develop the sexual scripts for your own behavior, and these scripts differ from one culture to another. For example, in some cultures,

#### CONNECTION • CHAPTER 13

The behavior therapies focus on what people do, rather than on what they think or feel. Such treatments are effective for a variety of problems, including phobias and other anxiety disorders.

**Sexual scripts** Socially learned ways of responding in sexual situations.

#### CONNECTION • CHAPTER 8

In general, scripts are the expectations we have for events in various situations, such as classrooms, restaurants, traffic jams, and picnics. Scripts often involve social situations—including sexual relationships.



foreplay is associated with fondling of the breasts; in others, breasts are regarded merely as appendages for nursing children.

Within our own culture, images from movies and television suggest the importance of kissing and touching and how to engage in these activities—or at least how beautiful actors and actresses (with many hours of “method” rehearsal) manage to engage in these displays. Advertisements, music videos, and conversations with friends also contribute to many young people’s sexual scripts. Unfortunately, while these scripts suggest images and goals, they can provide unreliable and unrealistic information. We assemble aspects of these scripts through social interaction over a lifetime. The attitudes and values embodied in one’s sexual scripts define one’s general approach to sexuality.

Problems can develop when people have different scripts for the same interaction. For example, a casual comment or a touch on the arm can mean something quite different for men and women—or even different persons of the same sex. Even when they are mates, one person’s merely friendly gesture may be perceived by the other as a sexual invitation. To avoid misunderstandings, it pays to rely on good communication rather than the assumption that both parties are following the same script.

**An Evolutionary Perspective on Sexuality** While the theory of sexual scripts emphasizes learned sexual behavior patterns, the evolutionary perspective looks for the origins of sexual motivation in our genes. Some observers (Buss, 2008) argue that genetic pressures have resulted in different mating strategies and, therefore, different gender roles, for males and females. (These views are a matter of emphasis: All theorists recognize that both learning and genetics affect our sexual behaviors.)

Biologically speaking, the goal of both sexes is to leave as many offspring as possible. Yet the potential physical costs of mating differ for males and females (Bjorklund & Shackelford, 1999). As a result, the sexes have evolved different—and sometimes conflicting—mating strategies, say evolutionary psychologists.

Females can produce only a few children over a lifetime, and they make a huge biological investment in pregnancy and a substantial commitment of time and energy in child rearing. Therefore, the best sexual strategy for females involves caution in mate selection. For males, however, the costs and benefits are much different because they cannot become pregnant—nor do they usually spend as much time with children as women do. For males, the theory says, the biggest payoff results from copulating as often as possible with mates who are in prime breeding condition. As a result, men tend to seek young and physically well-developed partners, while females may seek somewhat older mates who can offer resources, status, and protection for offspring. Not incidentally, these agendas often produce conflict, promiscuity, and sexual jealousy.

Although the evolutionary perspective may seem harsh in its view of sexual motivation, it does account for many gender differences in mating behaviors, such as the larger number of sexual partners typically reported by men than women. (See Table 9.4 on page 413.) Even so, biology does not prohibit the learning of alternative sex roles and scripts, nor does it explain the social and cultural pressures that cast men and women in different roles, as in religious groups that allow only men into the priesthood (Eagly & Wood, 1999). Moreover, it does not explain why most people remain with their mates over extended periods of time (Hazan & Diamond, 2000). A complete understanding of sexual motivation must include both its evolutionary roots and, especially in humans, the many variations that occur through learning.

**Sexual orientation** One’s erotic attraction toward members of the same sex (a homosexual orientation), the opposite sex (heterosexual orientation), or both sexes (a bisexual orientation).

**The What and Why of Sexual Orientation** Ever since Alfred Kinsey’s first reports, we have known that human **sexual orientation** is a complex issue. *Heterosexuality* and *homosexuality* represent two forms of sexual orientation, which refers to the direction or object of one’s sexual interests, either to the opposite sex or to the same sex. Another variation is *bisexuality*, which refers to attrac-

tion to both males and females. But to complicate matters, cross-cultural studies reveal considerable variability in sexual orientation. In parts of New Guinea, for example, the culture dictates that homosexual behavior is universal among young males, who then switch to a heterosexual orientation when they marry (Money, 1987). Among Americans, various estimates put the percentage of homosexuality at 1 to 4%, more or less, depending on whether homosexuality is defined as one's primary orientation or, more broadly, as any same-sex erotic behavior during one's lifetime (Diamond, 2007). As Table 9.4 (page 413) indicates, the incidence of homosexuality among females is about half that of males.

Incidentally, *transsexualism* refers to people who view themselves as persons of the sex opposite to their biological sex. They should not be confused with cross-dressers who indulge in a sexual fetish known as *transvestism*. (Those who cross-dress for nonsexual reasons are not classified under transvestism.) It is also important to realize that none of these variations predicts sexual orientation. That is, knowing that a person is transsexual or a cross-dresser does not tell us whether he or she is gay, lesbian, bisexual, or straight.

**Origins of Sexual Orientation** So, what does the available evidence tell us about the factors that determine sexual orientation? We know several things that are *not* involved. Speaking biologically, we know that sexual orientation in adults is *not* related to testosterone levels—although the issue of testosterone or estrogen influences in the fetus is still an open question (McAnulty & Burnette, 2004). From a social perspective, we also know that parenting styles or family configurations do *not* cause children to turn either toward heterosexuality or homosexuality (Golombok & Tasker, 1996). Similarly, researchers have come up empty handed in their attempts to link human sexual orientation to early sexual experiences.

A controversial theory proposed by Daryl Bem asserts that we become attracted to the sex that we, as young children, consider most unlike us. Bem has amassed considerable evidence in support of this “exotic becomes erotic” theory (Bem, 1996, 2001). (For an opposing viewpoint, however, see Peplau et al., 1998, who dispute Bem's interpretation of the evidence and argue that his theory does not take women's experiences into account.)

Attempts to identify biological origins of sexual feelings in the genes and the brain have also provoked controversy—and have shown some promise. For example, Richard Pillard and Michael Bailey (1991) studied sexual orientation of male identical twins. They discovered that when one twin is homosexual the chance of the other being homosexual is about 50%—as compared with an incidence of roughly 5 or 6% in the general population. This study also found that the rate drops to 22% for fraternal twins and 11% for adoptive brothers of homosexuals. A later study of female twin pairs produced essentially the same results (Bower, 1992).

One of the more puzzling findings links sexual orientation in males (but not females) to birth order, specifically how many older brothers one has (Abrams, 2007; Blanchard & Bogaert, 1996). The more older brothers a boy has, the more likely he is to have a same-sex orientation. This effect occurs whether or not boys are raised with their biological brothers, according to a study of adopted versus biological brothers—a finding that apparently rules out environmental influences (Bogaert, 2006). While no one knows what the causative factor is, some scientists believe that some aspect of the prenatal environment tips the balance one way or another (Bower, 2006a).

Research in this area remains controversial because of the strong feelings, political issues, and prejudices involved (Herek, 2000). Further, it has attracted scientific criticism because much of it is correlational—rather than experimental—so the data cannot establish cause and effect with certainty. Moreover, some observers object to this whole line of research, saying that gay men and lesbians should not feel pressured to justify their behavior by seeking a biological basis for it (Byne, 1995).



*The origins of sexual orientation are unclear, although some evidence points to biological factors. What is clear is that research on sexual orientation often generates controversy.*

**Not a Disorder** We should also note that, until the 1970s, the diagnostic manual of the American Psychiatric Association listed homosexuality as a mental disorder—a classification that has since been removed and repudiated by both psychologists and psychiatrists (Greenberg, 1997). But what does the evidence say about sexual orientation and mental health? The message coming through numerous recent studies show that mental problems and problem relationships occur in about the same proportion in heterosexuals and homosexuals (DeAngelis, 2002c; Kurdek, 2005). The exception involves stress-related problems (e.g., anxiety and depression) associated with discrimination against homosexuals.

So, where does this leave us in our understanding of sexual orientation? Attitudes toward minority forms of sexual orientation, such as homosexuality, differ sharply among cultures around the world, with Americans among the most divided on issues such as gay marriage. Most experts—but not all—would say that the research strongly supports some biological influence on sexual orientation. Just how biology might influence our behavior in the bedroom, however, remains a major puzzle and a topic for continuing research.

## ● PSYCHOLOGYMATTERS

### ● A Question of Will Power, Laughter, and Chocolate Cookies

● Psychologists don't talk much about "will power," although the term can be heard in everyday conversation, where it usually refers to resisting food, drink, or some other temptation. In particular, psychologists don't like the archaic assumption of the "will" as a special faculty of the mind—a throwback to 19th-century phrenology. Thus "will power" is like the term "instinct"—merely a label rather than an explanation. For example, we may say that people who are thin have "will power" but this label may simply obscure a difference in body chemistry. Psychologists also object to the term "will power" because it is often used as a put-down, to suggest that a person has a deficiency in character—a "weak will."

● **Alternatives to Will Power** Modern psychologists usually prefer terms such as *self-control* or *impulse control*—terms that have somewhat less baggage and can be related to environmental influences and to known brain mechanisms. For example, we know that controlling one's eating is more difficult during the holiday season, with its abundance of food. Similarly, damage to parts of the limbic system is known to make emotional control more difficult.

● Psychologists have also contrived devilish tests to measure impulse control. (Recall the "marshmallow test" in our discussion of emotional intelligence.) What have they found? To nobody's surprise, the ability to control one's impulses correlates with to all sorts of positive outcomes, including better mental health, more effective coping skills, better relationships, and higher academic achievement. But the problem has been that such research still leaves the big question unanswered: What *is* self-control—or "will power"?

● **The Biology of Self-Control** A team of researchers at Florida State University seems to have placed the ability to resist temptation on a solid scientific footing (Gailliot et al., 2007). What they found is that self-control has a biological basis. And it also has a price.

● The Florida group first placed undergraduate psychology students in one of several onerous situations in which they were asked to exercise self-control—such as resisting a tempting plate of freshly baked chocolate cookies or watching a funny video clip without laughing. Then the researchers gave the students a second task, such as a scrambled-word problem or a hand-eye coordination test. A control group also performed the second task, but they were not first asked to stifle their laughter nor were they exposed to plates of tempting cookies.

#### CONNECTION • CHAPTER 2

The 19th-Century phrenologists erroneously believed that the brain contains specialized "organs" corresponding to various mental faculties, including courage, pride, religion, perseverance, and sagacity.

Before we go any further, see if you can predict who did better on the second task. Was it the ones who had successfully resisted their impulses? Or the control group, who had been allowed to indulge themselves?

You were right if you guessed that those who had faced down temptation (resisting the cookies or soberly watching the funny video) were *less* successful on the subsequent task. Apparently self-control is a cognitive resource that, like physical stamina, can become temporarily depleted—and, surprisingly, it seems to have a physical presence in the blood, as well as in behavior. The study found that those who had been asked to control their urges had lower blood-sugar levels than those who had not restrained themselves. Because sugar (glucose) is an energy source for the body, the researchers speculate that exerting will power used up some of that energy, making people less efficient on the second task (Baumeister et al., 1998).

But there is hope for those weak of will! A sugared drink not only brought blood glucose back up to its original level, but it brought the performance of the self-controllers back to the level of the indulgers. Apparently, what we call “will power” is based, at least in part, on the body’s ready energy reserves.

So, should you have a cola and a candy bar to boost your “will” before the next psychology test? Probably not such a good idea, says Matthew Gailliot, leader of the Florida study—especially if you are trying to control your weight. Better, he says to keep your energy level up with longer-lasting proteins or complex carbohydrates (Cynkar, 2007).

And some additional advice from a cognitive perspective: If you want to insure that you are mentally sharp, moderation is a better strategy than denial.

## Check Your Understanding

- RECALL:** Describe the *multiple systems approach* to understanding hunger.
- RECALL:** Explain, from an evolutionary perspective, why obesity is becoming more prevalent in industrialized nations.
- RECALL:** From a biological perspective, in what respect is sex different from other biological drives, such as hunger and thirst?
- RECALL:** What are the four major differences between men’s and women’s sexuality, according to Peplau?
- ANALYSIS:** Why do psychologists avoid the term *will power*? What terms do they prefer instead?
- UNDERSTANDING THE CORE CONCEPT:** For which of the motives discussed in this section would biological factors be *least* important in accounting for the differences between one person and another?
  - hunger
  - thirst
  - a *n Ach*
  - sex

**Answers** 1. Because hunger has not only biological components but also cognitive, social, and cultural aspects, it must be understood as involving a complex interaction of factors. The multiple systems approach recognizes such factors as blood sugar and fat levels monitored by the hypothalamus, homeostatic feedback from fat cells, pressure and nutrient detectors in the stomach, reward systems in the brain, physical activity, emotional state, food-related stimuli, and social-cultural pressures. 2. From an evolutionary standpoint, the human body evolved in an environment that required much more physical exertion than is required of most people in industrialized countries. This decrease in activity, along with an abundance of calorie-dense foods, has led to obesity. 3. Sex is not a homeostatic drive. Peplau says that (a) men show more interest in sex than do women, (b) women are more likely to view sex in the context of a committed relationship, (c) males are more likely to associate sex with aggression, and (d) women’s sexuality has more plasticity than men’s. 4. The term *will power* suggests that it is a separate faculty of the mind, yet there is no evidence of a “will” that cannot be explained in more conventional terms that do not carry the baggage of a defect in character. Psychologists prefer to speak of “self-control” or “impulse control.” 5. c (because all the others involve biological drives)



# Critical Thinking Applied: Do “Lie Detectors” Really Detect Lies?

The **polygraph**, often called a “lie detector,” relies on the assumption that people will display physical signs of arousal when lying; so most polygraph machines make a record of the suspect’s heart rate, breathing rate, perspiration, and blood pressure. Occasionally, voice-print analysis is also employed. Thus, the device really acts as an emotional arousal detector, rather than a direct indicator of truth or lies. But does it work?

## What Are the Issues?

Who is telling the truth, and who is lying? It’s a question that poker players, the police, and ordinary citizens on jury duty confront routinely. It’s also a problem for U.S. embassy personnel around the world because people claiming to have information about bomb threats and other acts of terrorism show up in their offices every day (Dingfelder, 2004c). It is no wonder, then, that the polygraph has found wide use. Even if it doesn’t always work perfectly, it does seem better to have *some* way of distinguishing truth-tellers from liars than none at all. Or does it?

## What Critical Thinking Questions Should We Ask?

If you are unfamiliar with the issues—as most people are with the controversy surrounding the use of “lie detectors”—it may be impossible to know what critical thinking questions to ask. In that event, the best course of action is to look at the arguments on all sides (not a bad approach to any issue, in fact!). Having done so with the polygraph issue, your authors believe that the following issues are most important:

- *Is there a possibility of bias?* We think there is, and it comes in two forms. One comes from a formidable polygraph industry that has a vested interest in convincing the public that polygraph tests can, indeed, distinguish truth-tellers from liars. A second form of bias comes from those obsessed by fear of crime and terrorism and who see humanity in stark black-and-white terms—as consisting of good people and evil people. We should be especially wary in weighing claims presented by either of these groups.
- *Are there errors of logic involved?* We believe that proponents of the polygraph commit two types of

**Polygraph** A device that records or graphs many (“poly”) measures of physical arousal, such as heart rate, breathing, perspiration, and blood pressure. A polygraph is often called a “lie detector,” even though it is really an arousal detector.

logical error. The first involves pointing to individual cases in which they claim a “lie detector” test either revealed a liar or forced a confession from a reluctant suspect. This is nothing more than “proof by testimonial,” as we see all the time in ads for “miracle” weight-loss products or engine-oil additives. The fact is that testimonials are no substitute for a controlled scientific test.

- The other main logical error is *oversimplification*. By focusing on apparent successes, they may gloss over the failures—which, in the case of the polygraph, can be quite serious. As we will see, the polygraph failures can lead to a surprisingly large number of honest people being identified as liars.

To see what we mean, we need to ask a third question: *What is the evidence?*

**Evidence or Intimidation?** Without a doubt, wrongdoers sometimes confess when confronted with polygraph evidence against them. Yet, critics have pointed out several problems with the polygraphic procedure that could easily land innocent people in prison and let the guilty walk free (Aftergood, 2000). For example, polygraph subjects know when they are suspects, so some will give heightened responses to the critical questions, even when they are innocent. On the other hand, some people can give deceptive responses because they have learned to control or distort their emotional responses. To do so they may employ simple physical movements, drugs, or biofeedback training—a procedure in which people are given moment-to-moment information on certain biological responses, such as perspiration or heart rate (Saxe et al., 1985). Either way, a polygraph examiner risks incorrectly identifying innocent people as guilty and failing to spot the liars.

To help you judge whether “lie detectors” can reliably discriminate truth from falsehood, let’s sit in on a polygraph session.

**How Is a Polygraph Examination Conducted?** Polygraphers typically employ several tricks of their trade. They may start the interview by persuading the subject that the machine is highly accurate. A common ploy is to ask a series of loaded questions designed to provoke obvious emotional reactions. For example, “Did you ever, in your life, take anything that did not belong to you?” In another favorite technique, the examiner uses a deceptive stimulation procedure, or “stim test,” in which the subject draws a card from a “stacked” deck. Then, the examiner pretends to identify the card from the subject’s polygraph responses (Kleinmuntz & Szucko, 1984).

When the actual interrogation begins, it will consist of an artistic mix of *critical questions*, *irrelevant questions*, and *control questions*. The irrelevant questions (“Are you sitting down right now?”) are designed to elicit truthful answers accompanied by a physical response consistent with truth telling. The control questions (“Did you ever lie to your parents?”) are designed to elicit an anxious, emotionally aroused response pattern. Then, the examiner can compare the subject’s responses to these two types of questions with responses to the critical questions (“Did you steal the jewels?”). It is assumed that a guilty suspect will give a stronger response to the critical questions than to the irrelevant and control questions.

### What Conclusions Can We Draw?

Sensible as the procedure may seem, statistical issues call the polygraph procedure into question. Consider, for example, the problem of accuracy. Even if the examination were 95% accurate, the 5% error rate could lead to the misidentification of many innocent people as being guilty. To illustrate, imagine that your company arranges for all 500 of your employees to take a polygraph test to find out who has been stealing office supplies. Imagine also that only about 4% (20 out of 500 people) are really stealing, which is not an unreasonable estimate. If the lie detector test is 95% accurate, it will correctly spot 19 of these 20 thieves. But the polygrapher will still have a big problem. The test will also give 5% **false positives**, falsely fingering 5% of the innocent people. Of the 480 innocent employees, the polygraph will inaccurately implicate 24 as liars. That is, *you could end up with more people falsely accused of lying than people correctly accused of lying*. This was borne out in a field study of suspected criminals, who were later either convicted or declared innocent. The polygraph results were no better than a random coin flip (Brett et al., 1986).

An equally serious concern with polygraphy is that there are no generally accepted standards either for administering a polygraph examination or for interpreting its results. Different examiners could conceivably come to different conclusions based on the same polygraph record.

For these reasons, the U.S. Congress has outlawed most uses of polygraph tests in job screening and in most areas of the government, except for high security risk positions. Laws on the admissibility of polygraph evidence vary greatly among the states, with a few imposing complete bans and 20 more allowing such evidence only on agreement of both sides—although, in a few states, polygraph results are still routinely admissible in court (Gruben & Madsen, 2005). The National

**False positives** Mistaken identification of a person as having a particular characteristic. In polygraphy, a false positive is an erroneous identification of a truthful person as being a liar.

Academies of Science (2003) has recently released a report saying that the polygraph is too crude to be useful for screening people to identify possible terrorists or other national security risks.

### Alternative Approaches to Deception Detection

The reining-in of polygraph testing has spurred the development of alternative means of detecting dishonesty (Capps & Ryan, 2005; Lane, 2006). Much of this work has been devoted to paper-and-pencil instruments that are often called “integrity tests.” How well do these instruments work? Not very well, according to reports by the American Psychological Association and by the U.S. government’s Office of Technology Assessment. In general, like the polygraph, these instruments seem to be more accurate than mere interviews, but they also suffer from a high false-positive rate.

More recently, researchers have turned to brain scanning techniques to see if they can catch liars (Ross, 2003). A certain brain wave pattern known as P300 has been linked with a variety of attention-getting cues, such as hearing one’s name, but studies show it can also be evoked by fibbing. In addition, fMRI images show that lying activates all the brain areas involved in telling the truth, plus several more (Langleben et al., 2002). This suggests that lying is not something completely separate from the truth but an operation the liar must perform on the truth, says psychiatrist Daniel Langleben. All of which raises the concern that there is too much hype and too little solid evidence behind brain-scan based lie detection. In addition, some neuroscientists worry about the ethics of peering directly into people’s brains to “read” the neural traces of their private thoughts (Pearson, 2006).

The potential advantage of these newer brain-scan techniques is that they bypass the anxiety-response pathway used by polygraphy. By registering neural activity, they get much closer to the person’s actual thoughts. But how well do these alternative methods work? Not well enough for the police and the courts—yet.

Finally, Paul Ekman—the same one who studies universal facial expressions of emotion—has found that liars often display fleeting “microexpressions” and other nonverbal cues. In one study, Ekman and his colleague Maureen O’Sullivan found that some people are especially good at detecting deception, but they are a small minority. In their tests, most people perform at about the chance level. Still, Ekman and O’Sullivan hope to learn what the most perceptive look for and teach that to police officers and other concerned with crime and security issues (Adelson, 2004).

For more information on polygraphy, see “The Truth About Lie Detectors (aka Polygraph Tests)” on the *Psychology Matters* website: [www.psychologymatters.org/polygraphs.html](http://www.psychologymatters.org/polygraphs.html).

# Chapter Summary

## 9.1 What Do Our Emotions Do for Us?

**Core Concept 9.1:** Emotions help us to attend and respond to important situations and to convey our intentions to others.

**Emotion** is a process involving physiological arousal, cognitive interpretation, subjective feelings, and behavioral expression. Emotions can also act as motives. From an evolutionary standpoint, they help us approach or avoid recurring stimuli that are important for survival and reproduction. Socially, emotional expressions serve to communicate feelings and intentions.

At least seven basic facial expressions of emotion are universally understood across cultures, although these can be modified by culture-specific **display rules**. There is no consensus on the number of emotions humans can experience; most experts believe that there is a small number of basic emotions, which can mix to produce more complex emotions.

Some emotional differences between males and females have biological roots. This is seen in differential rates of certain emotional disorders, as well as more frequent displays of anger in men. On the other hand, cultural differences demonstrate that some gender differences in emotion are learned. Specifically, different cultures teach men and women different display rules about controlling emotional expression. Despite the differences, neither sex can be said to be more emotional than the other.

**Display rules** (p. 381)

**Emotion** (p. 378)

### MyPsychLab Resources 9.1:

**Watch:** Humor and Brains

**Simulation:** Survey on Happiness

**Watch:** Michael Cohn

## 9.2 Where Do Our Emotions Come From?

**Core Concept 9.2:** The discovery of two distinct brain pathways for emotional arousal has clarified how emotion works and has suggested solutions to long-standing issues in the psychology of emotion.

Neuroscience has revealed two distinct emotion systems in the brain. One, a fast-response system, operates mainly at an unconscious level and relies on deep limbic structures, especially the amygdala. The other involves conscious processing in the cortex. Emotions also involve visceral changes in response to messages transmitted by the autonomic nervous system and the hormone system. Understanding how the two emotion systems work has begun to resolve some controversies involving the roles of physical responses and cognition in emotion—particularly the interplay among physical responses, cognitions, and feelings of emotion.

The inverted U theory describes the complex relationship between arousal and performance: Increasing arousal produces improved performance, but only up to a certain level of optimum arousal, which depends on the complexity of the task. **Sensation seekers** seem to have an especially high need for arousal.

**Cannon–Bard theory** (p. 387)

**Lateralization of emotion**  
(p. 386)

**Inverted U function** (p. 391)

**Sensation seekers** (p. 391)

**James–Lange theory** (p. 387)

**Two-factor theory** (p. 388)

### MyPsychLab Resources 9.2:

**Explore:** Physiological, Evolutionary, and Cognitive Theories of Emotion

**Watch:** Emotion Regulation: James Coan

**Watch:** Interaction of Cognition and Emotion: Jutta Joormann

## 9.3 How Much Control Do We Have over Our Emotions?

**Core Concept 9.3:** Although emotional responses are not always consciously regulated, we can learn to control them.

**Emotional intelligence**, the ability to keep one's emotions from getting out of control, is vital for maintaining good social relationships. It is distinct from the abilities measured by traditional IQ tests. Increased emotional control can be achieved by learning, as demonstrated in anger management programs. Tests of emotional intelligence show that those who score highly tend to succeed in social situations.

On the negative side of emotional control, some people have learned to control their emotions for purposes of deception. Psychologists have sought, with

some success, to discover cues, both verbal and non-verbal, associated with lying. Most people, however, cannot detect liars at much better than a chance level.

While aggression can be the result of anger, people usually hold aggression in check. Under some circumstances, however, the expression of anger without aggression can have positive results—although the commonsense view that it is always good to vent anger and aggression is a dangerous myth. People who have trouble managing anger and aggression may benefit from cognitive therapy.

**Emotional intelligence** (p. 392)

### MyPsychLab Resources 9.3:

**Watch:** Lie Spy

## 9.4 Motivation: What Makes Us Act As We Do?

**Core Concept 9.4:** Motivation takes many forms, but all involve inferred mental processes that arouse us and then select and direct our behavior.

The concept of **motivation** refers to inferred internal processes that select and direct behavior, and it helps explain behavior that cannot be explained by the circumstances alone. Psychologists find it useful to distinguish psychological **motives** from biological **drives**, **intrinsic motivation** from **extrinsic motivation**, and **conscious motivation** from **unconscious motivation**.

Psychology has no successful theory that accounts for all of human motivation. Psychologists explain biologically based motivation in terms of **instinct theory** (and **fixed-action patterns**) and **drive theory**. They use cognitive theories to explain psychological motives, as in Rotter's **locus of control** theory. Freud called attention to **unconscious motivation** and taught that all our motives derive from unconscious sexual and aggressive desires. Maslow attempted to tie together a wide range of human motivation—from biological drives to psychological motives—into a **hierarchy of needs**. Critics have pointed out problems with all of these approaches.

Psychologists find that extrinsic rewards can produce **overjustification**, especially when rewards

are given without regard for the quality of performance.

Great achievements usually come from people in a state of **flow**. Those in a flow state are intrinsically motivated by some problem or activity. The use of drugs or alcohol to achieve an artificial flow feeling is not usually effective.

**Conscious motivation** (p. 399)

**Drive** (p. 398)

**Drive theory** (p. 400)

**Extrinsic motivation** (p. 399)

**Fixed-action patterns** (p. 399)

**Flow** (p. 404)

**Hierarchy of needs** (p. 401)

**Homeostasis** (p. 400)

**Instinct theory** (p. 399)

**Intrinsic motivation** (p. 398)

**Locus of control** (p. 400)

**Motivation** (p. 397)

**Motive** (p. 398)

**Need** (p. 400)

**Overjustification** (p. 403)

**Unconscious motivation** (p. 399)

### MyPsychLab Resources 9.4:

**Explore:** Theories of Motivation and Job Performance

**Explore:** Maslow's Hierarchy of Needs



## 9.5 How Are Achievement, Hunger, And Sex Alike? Different?

**Core Concept 9.5** No single theory accounts for all forms of motivation because each motive involves its own mix of biological, mental, behavioral, and social/cultural influences.

Some motives rely heavily on learning, while others depend more heavily on biological factors. Moreover, motives differ in their sensitivity to environmental cues, reinforcers, and social/cultural influences.

Achievement is a psychological motive that accounts for an important segment of human behavior, both in school and on the job, although McClelland has argued that the needs for power and affiliation are just as important as *n Ach*. Studies also show that societies vary in the intensity of their need for achievement, depending on their tendencies toward **individualism** or **collectivism**.

In contrast, hunger and eating are motivated at many levels—by biological processes, external cues, social influences, and learning, for example—and are best understood by a multiple-systems approach. Americans receive mixed messages from the media, promoting both thinness and calorie-dense foods. The causes of the eating disorders **anorexia nervosa** and **bulimia nervosa** are not known, but both cultural and genetic factors have been implicated. The problem of obesity has become epidemic in America and is rapidly being exported throughout the world. Many people seek to control their appetite and body weight, although no weight-loss scheme is effective for most people over the long run.

Unlike hunger and weight control, the sex drive is not homeostatic, even though sexual motivation is heavily influenced by biology. Sexual behavior in humans also depends on learning—of various sexual scripts. Particularly since Kinsey's surveys, the scientific study of sexuality has long caused controversy in America, even though survey research shows that, over the

last half century, Americans have become more liberal in their sexual practices. Masters and Johnson were the first to do extensive studies of sexual behavior in the laboratory, finding that the **sexual response cycles** of men and women are similar. More recently, Peplau has emphasized differences in male and female sexuality. Those adhering to the controversial evolutionary perspective argue that differences in male and female sexuality arise from conflicting mating strategies and from the large biological investment women have in pregnancy—both of which encourage more promiscuity in men. Despite its roots in biology, sexuality is affected by learning, as seen in sexual cues and **sexual scripts**. The greatest puzzle about sexuality, however, centers on the origins of **sexual orientation**, although there is good evidence that biological factors play a role.

*Will power* is a common term in everyday language, although psychologists avoid it because it suggests a separate faculty of the mind. They prefer *impulse control* or *self-control*, terms that can be explained in terms of brain mechanisms and environmental influences. Recently, researchers have found that impulse control takes a cognitive toll and is reflected in blood sugar levels.

**Anorexia nervosa** (p. 410)

**Bulimia nervosa** (p. 410)

**Collectivism** (p. 407)

**Individualism** (p. 407)

**False positive** (p. 422)

**Need for achievement (*n Ach*)**  
(p. 405)

**Polygraph** (p. 420)

**Set point** (p. 408)

**Sexual orientation** (p. 416)

**Sexual response cycle** (p. 414)

**Sexual scripts** (p. 415)

### MyPsychLab Resources 9.5:

**Watch:** Cognition, Emotion, and Motivation Across Cultures: Shinoby Kitayama

**Watch:** Food and the Brain

**Watch:** Eating Disorders

# Discovering Psychology Viewing Guide



Watch the following video by logging into MyPsychLab ([www.mypsychlab.com](http://www.mypsychlab.com)). After you have watched the video, complete the activities that follow.



## PROGRAM 12: MOTIVATION AND EMOTION

### PROGRAM REVIEW

- What is the general term for all the physical and psychological processes that start behavior, maintain it, and stop it?
  - explanatory style
  - repression
  - addiction
  - motivation
- Phoebe has a phobia regarding cats. What is her motivation?
  - environmental arousal
  - overwhelming fear
  - repressed sexual satisfaction
  - a need for attachment to others
- What is the role of the pleasure-pain principle in motivation?
  - We repress our pleasure in others' pain.
  - We seek pleasure and avoid pain.
  - We persist in doing things, even when they are painful.
  - We are more intensely motivated by pain than by pleasure.
- Which activity most clearly involves a "reframing" of the tension between desire and restraint?
  - eating before you feel hungry
  - seeking pleasurable physical contact with others
  - working long hours for an eventual goal
  - getting angry at someone who interferes with your plans
- Sigmund Freud thought there were two primary motivations. One of these is
  - expressing aggression.
  - seeking transcendence.
  - fulfilling creativity.
  - feeling secure.
- Compared with Freud's view of human motivation, that of Abraham Maslow could be characterized as being more
  - negative.
  - hormonally based.
  - optimistic.
  - pathologically based.
- Behaviors, such as male peacocks displaying their feathers or male rams fighting, are related to which part of sexual reproduction?
  - providing a safe place for mating
  - focusing the male's attention on mating
  - selecting a partner with good genes
  - mating at the correct time of year
- In Norman Adler's research on mating behavior in rats, what is the function of the ten or so mountings?
  - to trigger hormone production and uterine contractions in the female
  - to warn off rival males
  - to cause fertilization
  - to impress the female
- What kinds of emotions tend to be involved in romantic love?
  - mainly intense, positive emotions
  - mainly intense, negative emotions
  - a mixture of intense and weak emotions that are mainly positive
  - a mixture of positive and negative emotions that are intense
- Charles Darwin cited the similarity of certain expressions of emotions as evidence that
  - all species learn emotions.
  - emotions are innate.
  - emotions promote survival of the fittest.
  - genetic variability is advantageous.
- Pictures of happy and sad American workers are shown to U.S. college students and to Italian workers. Based on your knowledge of Paul Ekman's research, what would you predict about how well the groups would identify the emotions?
  - Both groups will identify the emotions correctly.
  - Only the Americans will identify the emotions correctly.

- c. Only the Italians will identify the emotions correctly.
- d. Neither group will identify the emotions correctly.
12. Theodore has an explanatory style that emphasizes the external, the unstable, and the specific. He makes a mistake at work that causes his boss to become very angry. Which statement is Theodore most likely to make to himself?
- "I always make such stupid mistakes."
  - "I was just distracted by the noise outside."
  - "All my life, people have always gotten so mad at me."
  - "If I were a better person, this wouldn't have happened."
13. Why does Martin Seligman believe that it might be appropriate to help children who develop a pessimistic explanatory style?
- These children are unpleasant to be around.
  - These children lack contact with reality.
  - These children are at risk for depression.
  - Other children who live with these children are likely to develop the same style.
14. What other outcome will a pessimistic explanatory style likely affect, according to Seligman?
- health
  - artistic ability
  - reasoning skills
  - language competence
15. All of the following are possible origins of a pessimistic explanatory style, *except*
- assessments by important adults in our lives.
  - the reality of our first major negative life event.
  - our mother's pessimism level.
  - our level of introversion/extraversion.
16. Which theorist is best known for positing a hierarchy of needs that humans strive to meet?
- Freud
  - Rogers
  - Maslow
  - Seligman
17. Although motivation can lead to unpleasant states (e.g., hunger, frustration), it seems to have evolved because of its benefits to
- survival.
  - propagation of the species.
  - health.
  - all of the above.
18. What has Robert Plutchik argued about emotions?
- There are three basic types of emotions: happiness, sadness, and anger.
  - There are eight basic emotions, consisting of four pairs of opposites.
  - Love is not a universal emotion; some cultures do not show signs of having it.
  - Emotional experience is determined by physiology alone.
19. Four people have been obese for as long as they can remember. Their doctors tell all of them that their obesity is putting them at risk for several illnesses. Who is most likely to join a gym, go on a diet, and get in shape?
- Al, whose explanatory style includes an internal locus of control
  - Bob, who has a pessimistic explanatory style
  - Chuck, whose explanatory style includes an unstable locus of control
  - Dwayne, who is depressed about his obesity
20. Wolves and squirrels are most likely to show which of the following in their mating patterns?
- romantic love
  - competition by females for males
  - competition by males for females
  - a preference for mating in the autumn so that the offspring will be born during the winter

## QUESTIONS TO CONSIDER

- Human sexual motivation expresses itself in sexual scripts that include attitudes, values, social norms, and expectations about patterns of behavior. Consider how males and females might develop different sexual scripts. How might lack of synchronization affect a couple? How might sexual scripts change as the bad news about sexually transmitted diseases and AIDS increases?
- If you could choose between taking this course and receiving a pass/fail (credit only) or getting a letter grade, which would you choose? How would your decision affect your study time, motivation, and test-taking behavior?
- Imagine you are moving to a country whose culture you aren't familiar with. Describe some of the social problems you might encounter because you don't know the cultural norms regarding expression of emotion.

## ACTIVITIES

- Are people sad because they cry, or do people cry because they are sad? Can making a sad face make someone feel sad? Does going through the motions trigger the emotion? Try this: Set aside 10 to 15 minutes for this experiment. Write down the words *happy*, *sad*, *angry*, and *fearful* on slips of paper. In

front of a mirror, select one of the slips and watch yourself as you create the facial expression for it. Hold the expression for at least a minute. Note the thoughts and physical reactions that seem to accompany your facial expression. Then relax your face and repeat the exercise with another slip of paper. Which theories does your experience support or challenge?

2. Observe the activities on which you need to concentrate when your hunger has been satisfied, compared with when you are very hungry. How well can you focus on more abstract motivations when your biological motivations have been left unmet?