

Motivation and Emotion

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They were on their way to “Gold Mountain”—their name for Canada. There were almost 500 of them in four rusted cargo ships. Each of them had their own story, their own thoughts, their own hopes, and their own limitations. The one thing they had in common was a desire to live in Canada—no matter what the cost and no matter what the means.

Starting in May 1998 until September 1999, these “boat people” as they came to be known, ventured across the Pacific to start a new life. In all cases, the boats were detected by the Canadian Coast Guards and guided into the port of Manama in British Columbia. The refugees, primarily young men with a few women and children, were detained awaiting the decision of the Canadian government regarding their future. Canadians responded quickly and vocally. Some reacted with anger because migrants were trying to enter their country by illegal means, others with compassion for the difficult and life-threatening ordeal the migrants had suffered in order to enter a promised land. Some people

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responded by writing letters, protesting and demanding action; others offered their services, aid, and support; and others merely watched as the events unfolded. Canadians' concept of fairness, the openness of our country, and the diversity of our people were tested. The fates of the "boat people" were mixed. Some were detained for long periods with no resolution. Others were released and allowed to place refugee claims. A final group was returned to their homeland ("Canada praised," 2000; Harper, 2000).

This story touched every Canadian. It challenged us emotionally, cognitively, and, for some on the front lines, physically. Psychologists have always had a strong interest in determining why people do the things they do. It may be difficult for us to imagine the circumstances that prompted each of the Chinese refugees to make such a drastic decision. The risks of embarking on such a dangerous voyage and the ramifications of being caught make their decisions all the more remarkable. Nonetheless, given what we have learned about these people, and given what we know about ourselves, the question arises, "Would we have done the same?" Are the things that motivated them different from what motivates us? The story of the refugees and other similar feats expose us to the extraordinary drive, spectacular efforts, and acts of courage or heroism that individuals demonstrate everyday. Are such individuals born with special talents or exceptional genes? What motivates them? Perhaps more importantly, what motivates us?

Introduction to Motivation

What is the difference between intrinsic and extrinsic motivation?

behaviour in order to satisfy physiological and psychological needs. At any given time our behaviour may be explained by one or a combination of **motives**—needs or desires that energize and direct behaviour toward a goal. Motives can arise from an internal need, such as when we are hungry and look for something to eat. In such cases we are pushed into action from within. Other motives come from

In this chapter on **motivation**, we look at the underlying processes that initiate, direct, and sustain

outside: some external stimulus, or **incentive**, pulls or entices us to act. After finishing a huge meal, some people yield to the temptation of a delicious dessert. At times like this, it is the external tempter, not the internal need for food, that moves us.

The intensity of our motivation, which depends on the number and strength of the motives involved, has a bearing on the effort and the persistence with which we pursue our goals. Sometimes we pursue an activity as an end in itself simply because it is enjoyable, not because any external reward is attached to it. This type of motivation is known as **intrinsic motivation**. On the other hand, when we engage in activities not because they are enjoyable but to gain some external reward or to avoid some undesirable consequence, we are pulled by **extrinsic motivation**. If you are working hard in this course solely because you find the subject interesting, your motivation is intrinsic. But if you are studying only to meet a requirement or to satisfy some other external need, your motivation is extrinsic. In real life, the motives for many activities are both intrinsic and extrinsic. You may love your job, but you would probably be motivated to leave if your salary—an important extrinsic motivator—were taken away. Table 9.1 gives examples of intrinsic and extrinsic motivation.

What do the experts say about the motives behind our behaviour? Consider some theories of motivation and find out.

Theories of Motivation

Do we act the way we do because of our inherent nature—the inborn, biological urges that push us from within? Or do we act because of the incentives that pull us from without? Obviously, both forces

TABLE 9.1
Intrinsic and Extrinsic Motivation

	Description	Examples
Intrinsic motivation	An activity is pursued as an end in itself because it is enjoyable and rewarding.	A person anonymously donates a large sum of money to a university to fund scholarships for hundreds of deserving students. A child reads several books each week because reading is fun.
Extrinsic motivation	An activity is pursued to gain an external reward or to avoid an undesirable consequence.	A person agrees to donate a large sum of money to a university for the construction of a building, provided it will bear the family name. A child reads two books each week to avoid losing television privileges.

influence us; theories of motivation differ in the relative power they attribute to each. The most thoroughly biological theories of motivation are the instinct theories.

Instinct Theories of Motivation

How do instinct theories explain motivation?

Scientists have learned much about instincts by observing animal behaviour. Spiders instinctively spin their intricate webs without having *learned* the technique from other spiders. It is neither a choice they make nor a task they learn, but an instinct. An **instinct** is an inborn, unlearned, fixed pattern of behaviour that is characteristic of an entire species. An instinct does not improve with practice, and an animal will perform it the same way even if it has never seen another member of its species. Even when their web-spinning glands are removed, spiders still perform the complex spinning movements and then lay their eggs in the imaginary web they have spun. So instincts tell us a great deal about animal behaviour.

But can human motivation be explained by **instinct theory**—the notion that we are motivated by certain innate, unlearned tendencies that are part of the genetic makeup of all individuals? Instinct theory was widely accepted by psychologists and others for the first 20 or 30 years of the 20th century. Over the course of those decades, the list of instincts expanded until thousands of instincts were being proposed to explain human behaviour. Common experience alone suggests that human behaviour is too richly diverse, and often too unpredictable, to be considered

fixed and invariant across our species (Hood, 1995). Today, most psychologists reject the instinct theory as an explanation of human motivation.

Drive-Reduction Theory: Striving to Keep a Balanced Internal State

What is the drive-reduction theory of motivation?

Another major attempt to explain motivation, human and otherwise, is the **drive-reduction theory**, or the drive theory, popularized by Clark Hull (1943). According to Hull, all living organisms have certain

motivation: The process that initiates, directs, and sustains behaviour to satisfy physiological or psychological needs.

motives: Needs or desires that energize and direct behaviour toward a goal.

incentive: An external stimulus that motivates behaviour (examples: money, fame).

intrinsic motivation: The desire to perform an act because it is satisfying or pleasurable in and of itself.

extrinsic motivation: The desire to perform an act in order to gain a reward or to avoid an undesirable consequence.

instinct: An inborn, unlearned, fixed pattern of behaviour that is characteristic of an entire species.

instinct theory: The notion that human behaviour is motivated by certain innate tendencies, or instincts, shared by all individuals.

drive-reduction theory: A theory of motivation suggesting that a need creates an unpleasant state of arousal or tension called a drive, which impels the organism to engage in behaviour that will satisfy the need and reduce tension.

biological needs that must be met if they are to survive. A need gives rise to an internal state of tension or arousal called a **drive**, and we are motivated to reduce it. For example, when we are deprived of food or go too long without water, our biological need causes a state of tension, in this case the hunger or thirst drive. We become motivated to seek food or water to reduce the drive and satisfy our biological need.

Drive-reduction theory is derived largely from the biological concept of **homeostasis**—the tendency of the body to maintain a balanced, internal state to ensure physical survival. Body temperature, blood sugar, water balance, oxygen—in short, everything required for physical existence—must be maintained in a state of equilibrium, or balance. When this state is disturbed, a drive is created to restore the balance, as shown in Figure 9.1. But drive theory cannot fully account for the broad range of human motivation.

It is true that we are sometimes motivated to reduce tension, as the drive-reduction theory states, but often we are just as motivated to increase it. Why do people seek activities that actually create a state of tension—hang-gliding, horror movies, bungee-jumping, and so on? Why do animals and humans alike engage in exploratory behaviour when it does not serve to reduce any primary drive?

Arousal Theory: Striving for an Optimal Level of Arousal

How does arousal theory explain motivation?

Arousal theory can answer some of the puzzling questions that drive-reduction theory cannot answer. **Arousal**

refers to a person's state of alertness and mental and physical activation. It ranges from no arousal (as in comatose), to moderate arousal (when we are pursuing normal day-to-day activities), to high arousal (when we are excited and highly stimulated).

Unlike drive-reduction theory, **arousal theory** does not suggest that we are always motivated to reduce arousal or tension. Arousal theory states that we are motivated to maintain an optimal level of arousal. If arousal is less than the optimal level, we do something to stimulate it; if arousal exceeds the optimal level, we seek to reduce it.

Biological needs, such as the needs for food and water, increase our arousal. But we also become aroused when we encounter new stimuli or when the intensity of stimuli is increased, as with loud noises, bright lights, or foul odours. And of course, certain kinds of drugs—stimulants such as caffeine, nicotine, amphetamines, and cocaine—also increase arousal.

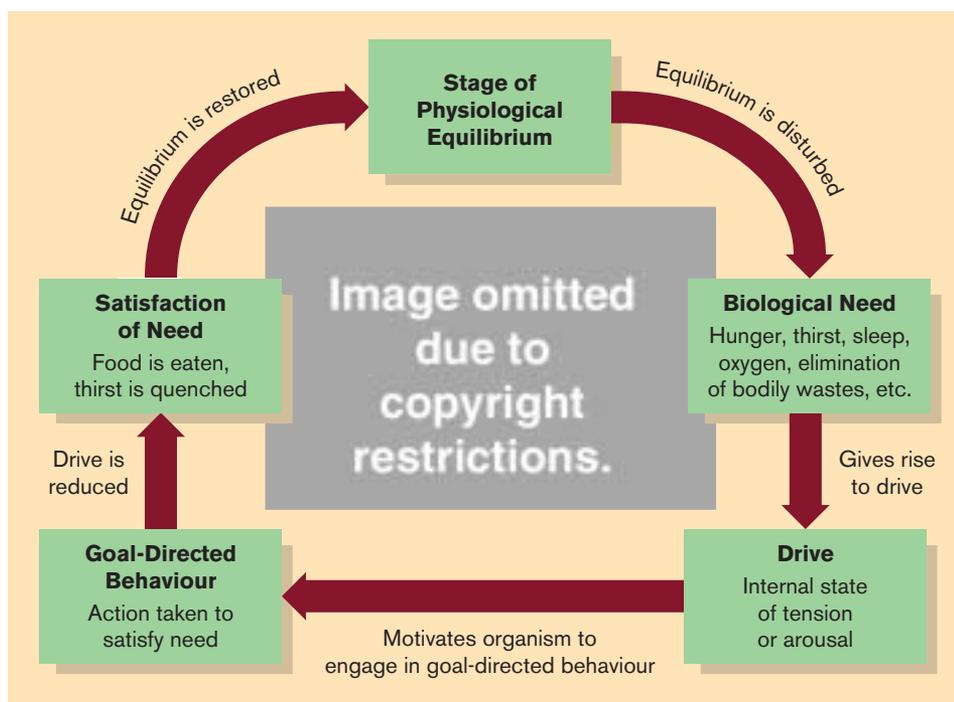


FIGURE 9.1

Drive-Reduction Theory

Drive-reduction theory is based on the biological concept of homeostasis—the body's natural tendency to maintain a state of internal balance, or equilibrium. When the equilibrium becomes disturbed (e.g., when we are thirsty and need water), a drive (internal state of arousal) emerges. Then the organism is motivated to take action to satisfy the need, thus reducing the drive and restoring equilibrium.

REVIEW & REFLECT 9.1

Theories of Motivation

Theory	View	Example
Instinct Theory	Behaviour is the result of innate, unlearned tendencies. (This view has been rejected by most modern psychologists.)	Two people fight because of their aggressive instinct.
Drive-Reduction Theory	Behaviour results from the need to reduce an internal state of tension or arousal.	Eating to reduce hunger.
Arousal Theory	Behaviour results from the need to maintain an optimal level of arousal.	Climbing a mountain for excitement; listening to classical music for relaxation.

Psychologists once believed that people generally felt better when their arousal level was moderate (Berlyne, 1971). But current theories suggest that people differ in the level of arousal they prefer. Some people are sensation seekers who love the thrills of new experiences, while others prefer the routine of a predictable life (McCourt et al., 1993).

Review & Reflect 9.1 summarizes the three major motivation theories that we have discussed: instinct, drive reduction, and arousal.

Stimulus Motives: Increasing Stimulation

When arousal is too low, **stimulus motives**, such as curiosity and the motives to explore, to manipulate objects, and to play, cause us to increase stimulation. Young monkeys will play with mechanical puzzles for long periods just for the stimulation of doing so (Harlow, 1950, 1953). Rats will explore intricate mazes when they are neither thirsty nor hungry and when no reinforcement is provided (Dashiell, 1925). Animals, including humans, will spend more time exploring novel objects than familiar ones.

Arousal and Performance

There is often a close link between arousal and performance. According to the **Yerkes-Dodson law**, performance on tasks is best when arousal level is appropriate to the difficulty of the task. Although optimal levels of arousal vary from person to person (Ebbeck & Weiss, 1988), we tend to perform better on simple tasks when arousal is relatively high. Tasks of moderate difficulty are best accomplished when our arousal is moderate; we do better on complex or difficult tasks when arousal is lower. Performance suffers when arousal level is either too high or too

low for the task. You may have experienced too much or too little arousal when taking an exam. Perhaps your arousal was so low that your mind was sluggish and you didn't even finish the test; or you may have been so keyed up that you couldn't remember much of what you had studied.

The Effects of Sensory Deprivation: Sensory Nothingness

How would you like to be paid to do absolutely nothing? In an early experiment, Bexton and colleagues (1954) at McGill University gave student volunteers this opportunity when they studied the effects of **sensory deprivation**—a condition in which sensory stimulation is reduced to a minimum or eliminated.

drive: A state of tension or arousal brought about by an underlying need, which motivates one to engage in behaviour that will satisfy the need and reduce the tension.

homeostasis: The tendency of the body to maintain a balanced internal state with regard to oxygen level, body temperature, blood sugar, water balance, and so forth.

arousal: A state of alertness and mental and physical activation.

arousal theory: A theory suggesting that the aim of motivation is to maintain an optimal level of arousal.

stimulus motives: Motives that cause us to increase stimulation and that appear to be unlearned (examples: curiosity and the need to explore, manipulate objects, and play).

Yerkes-Dodson law: The principle that performance on tasks is best when arousal level is appropriate to the difficulty of the task—higher arousal for simple tasks, moderate arousal for tasks of moderate difficulty, and lower arousal for complex tasks.

sensory deprivation: A condition in which sensory stimulation is reduced to a minimum or eliminated.

Students had to lie motionless in a specially designed sensory-deprivation chamber in which sensory stimulation was severely restricted, as in the photograph. The participants could eat, drink, and go to the bathroom when they wanted to. Occasionally they were tested for motor and mental function. Otherwise they were confined to their sensationless prison.

Did they enjoy the experience? Hardly! Half the participants quit the experiment after the first two days. Those who remained eventually became irritable, confused, and unable to concentrate. They began to have visual hallucinations. Some began to hear imaginary voices and music and felt as if they were receiving electric shocks or being hit by pellets. Their performance on motor and cognitive tasks deteriorated. None said they liked the experiment.

But are the effects associated with sensory deprivation always negative? Not at all, according to University of British Columbia researcher Peter Suedfeld (Suedfeld & Borrie, 1999; Suedfeld & Coren, 1989). He and his colleagues developed a milder form of sensory deprivation known as “restrictive environmental stimulation (REST),” which has produced beneficial effects ranging from better control over cigarette smoking (Suedfeld, 1990) and other addiction (Borrie, 1991) to relief from tension headaches (Wallabaum et al., 1991). One study has even reported beneficial effects for autistic children (Harrison & Barabasz, 1991).

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www.nacd.org/articles/sensdep.html
Sensory deprivation

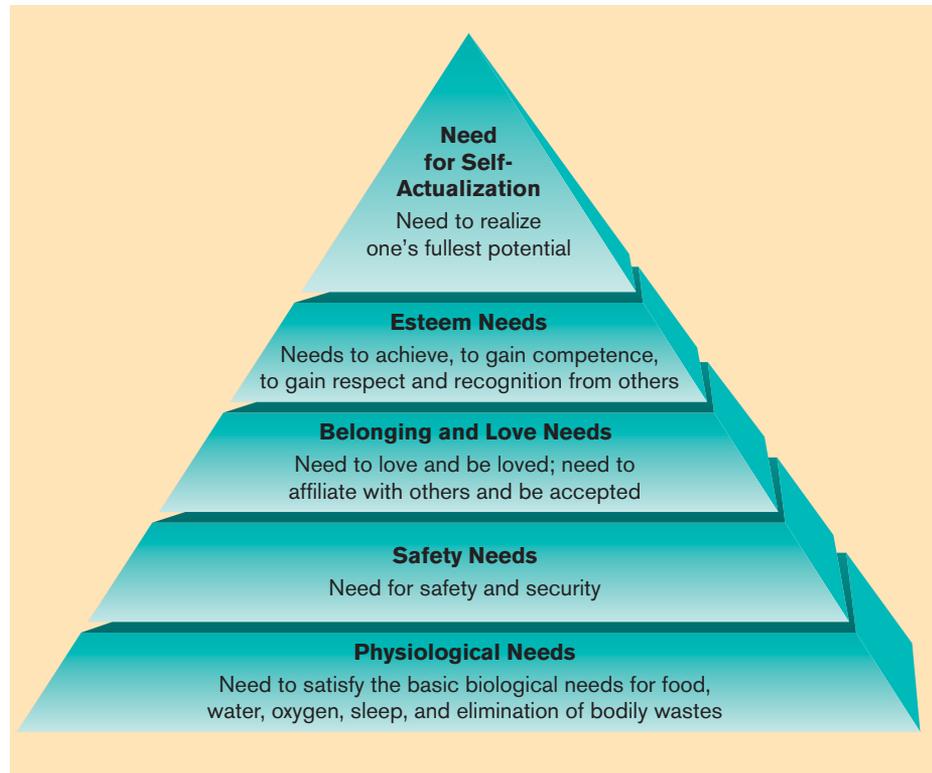


FIGURE 9.2
Maslow's Hierarchy of Needs

Maslow's Hierarchy of Needs: Putting Our Needs in Order

How does Maslow's hierarchy of needs account for human motivation?

Humans have a variety of needs or motives. Clearly some needs are more critical to sustaining life than others. We could

live without self-esteem, but obviously we could not live long without air to breathe, water to drink, or food to eat.

Abraham Maslow (1970) proposed a **hierarchy of needs** (see Figure 9.2) to account for the range of human motivation. He placed physiological needs such as food and water at the base of the hierarchy, stating that these needs must be adequately satisfied before higher ones can be considered.

Once our physiological needs (for water, food, sleep, sex, and shelter) are met, the motives at the next higher level—the safety and the security needs—come into play. Once these needs are satisfied, we climb to the next level to satisfy our needs to belong,

Remember It!

Theories of Motivation

- When you engage in an activity to gain a reward or to avoid an unpleasant consequence, your motivation is (intrinsic/extrinsic).
- In its original form, drive-reduction theory focused primarily on which of the following needs and the drives they produce?
 - cognitive
 - psychological
 - biological
 - emotional
- Which theory suggests that human behaviour is motivated by certain innate, unlearned tendencies that are shared by all individuals?
 - arousal theory
 - instinct theory
 - Maslow's theory
 - drive-reduction theory
- According to arousal theory, people seek _____ arousal.
 - minimized
 - increased
 - decreased
 - optimal
- According to Maslow's hierarchy of needs, which needs must be satisfied before a person will try to satisfy the belonging and love needs?
 - safety and self-actualization needs
 - self-actualization and esteem needs
 - physiological and safety needs
 - physiological and esteem needs

Answers: 1. extrinsic 2. c 3. b 4. d 5. c

Image omitted due to copyright restrictions.

Sensory stimulation is reduced to a minimum for participants in sensory-deprivation experiments.

and to love and be loved. Maslow believed that failure to meet the belonging and love needs deprives individuals of acceptance, affection, and intimacy and is the most prominent factor in human adjustment problems. Still higher in the hierarchy are the needs for self-esteem and the esteem of others. These needs involve our sense of worth and competence, our need to achieve and be recognized for it, and our need to be respected. At the top of Maslow's hierarchy is the need for **self-actualization**, the need to realize our full potential. People may reach self-actualization through achievement in virtually any area of life's work.

Maslow's hierarchy of needs has been a popular notion, appealing to many, but much of it has not been verified by empirical research. The steps on the hierarchy may not be the same for all people (Goebel & Brown, 1981; Wahba & Bridwell, 1976). It is well known that in some people the desire for success and recognition is so strong that they are prepared to sacrifice safety, security, and personal relationships to achieve it. A few people are willing to sacrifice their very lives for others or for a cause to which they are committed. Perhaps they, too, have a hierarchy, but one in which the order of needs is somewhat different.

LINK IT!

www.maslow.com/index.html

Abraham Maslow publications site

hierarchy of needs:

Maslow's theory of motivation, in which needs are arranged in order of urgency ranging from physical needs to security needs, belonging needs, esteem needs, and finally

the need for self-actualization.

self-actualization: The development of one's full potential; the highest need on Maslow's hierarchy.

The Primary Drives: Hunger and Thirst

Drive-reduction theory, as we have seen, suggests that motivation is based largely on the **primary drives**, those that are unlearned and that seek to satisfy biological needs. Two of the most important primary drives are thirst and hunger.

Thirst: We All Have Two Kinds

Under what kinds of conditions do the two types of thirst occur?

Thirst is a basic biological drive. Adequate fluid is critical because the body itself is about 75 percent water. Without any intake of fluids, we can survive only about four or five days.

But how do we know when we are thirsty? When we have a dry mouth and throat, or a powerful urge to drink? Yes, of course. But thirst is more complex than that. There are two types of thirst signalling us to drink. One type, extracellular thirst, occurs when fluid is lost from the body tissues. When you are exercising heavily or doing almost anything in hot weather, you perspire and lose bodily fluid. Bleeding, vomiting, and diarrhea also rob your body of fluid. Perhaps you have heard that it is not a good idea to drink a cold beer or any other type of alcohol to quench your thirst on a very hot day. Alcohol increases extracellular fluid loss. This is why most people awaken with a powerful thirst after drinking heavily the night before.

Another type of thirst, intracellular thirst, involves the loss of water from inside the body cells. When we eat a lot of salty food, the water-sodium balance in the blood and in the tissues outside the cells is disturbed. The salt cannot readily enter the cells, so the cells release some of their own water to restore the balance. As the body cells become dehydrated, thirst is stimulated so that we drink to increase the water volume (Robertson, 1983). Might this explain why salted peanuts and pretzels are provided at many bars free of charge?

The Biological Basis of Hunger: Internal Hunger Cues

Hunger is a biological drive operating in all animals. But what happens in our bodies to make us feel hun-

gry, and what causes satiety—the feeling of being full or satisfied?

The Role of the Hypothalamus: Our Feeding and Satiety Centre

What are the roles of the lateral hypothalamus and the ventromedial hypothalamus in the regulation of eating behaviour?

Researchers have found two areas of the hypothalamus that are of central importance in regulating eating behaviour and

thus affect the hunger drive (Steffens et al., 1988). The **lateral hypothalamus (LH)** acts in part as a feeding centre to excite eating. Stimulating the feeding centre causes animals to eat even when they are full (Delgado & Anand, 1953). When the feeding centre is destroyed, animals initially refuse to eat (Anand & Brobeck, 1951).

The **ventromedial hypothalamus (VMH)** presumably acts as a satiety centre. When active, it inhibits eating (Hernandez & Hoebel, 1989). Electrically stimulating the satiety centre causes animals to stop eating (Duggan & Booth, 1986). If the VMH is surgically removed, experimental animals soon eat their way to gross obesity (Hetherington & Ranson, 1940; Parkinson & Weingarten, 1990). One rat whose satiety centre was destroyed weighed nearly six times as much as a normal rat. In human terms this would be like a person who weighs 67 kilograms ballooning up to 405 kilograms.

Some researchers believe that destruction of the VMH causes animals to lose the ability to adjust their metabolism and thereby stabilize their body weight (Vilberg & Keesey, 1990).

Image omitted due to copyright restrictions.

A rat whose satiety centre has been destroyed can weigh up to six times as much as a normal rat.

Hunger regulation, however, is not as simple as an off/on switch regulated by the LH and VMH. These two areas of the hypothalamus are just components of the brain's complex system for regulating hunger (Stricker & Verbalis, 1987). Other organs and substances in the body also play a role in our feelings of hunger and satiety.

The Role of the Stomach: Hunger Pangs

What are some of the body's hunger and satiety signals?

The fullness of the stomach affects our feeling of hunger. The stomach has a capacity of about 0.5 litres when empty and stretches to hold 1.2 litres when full (Avraham, 1989). Generally, the fuller or more distended the stomach, the less hunger we feel (Pappas et al., 1989).

How do you know when you are hungry? Does your stomach growl? Do you have stomach contractions, or “hunger pangs”? In a classic experiment, Cannon and Washburn (1912) demonstrated a close correlation between stomach contractions and the perception of hunger. But their discovery does not necessarily mean that the sensation of hunger is caused by stomach contractions. Additional research has confirmed that humans and other animals continue to experience hunger even when it is impossible for them to feel stomach contractions. Human cancer and ulcer patients who have had their entire stomachs removed still report that they feel hunger pangs (Janowitz & Grossman, 1950).

Other Hunger and Satiety Signals

Templeton and Quigley (1930) found that the blood of an animal that has eaten its fill is different from the blood of an excessively hungry animal. The dif-

ference was related to the blood levels of glucose—a simple sugar resulting from the digestion of carbohydrates. Glucose is highly associated with our perceptions of hunger. For instance, nutrient detectors in the liver constantly monitor blood levels of glucose and send this information to the brain (Friedman et al., 1986). Hunger is stimulated when the brain receives the message that blood glucose levels are low. Insulin, a hormone produced by the pancreas, chemically converts glucose into energy that is usable by the cells. Elevations in insulin cause an increase in hunger, in food intake, and in a desire for sweets (Rodin et al., 1985). Chronic oversecretion of insulin often leads to obesity.

Hunger is also influenced by some of the substances secreted by the gastrointestinal tract during digestion, which are released into the blood and act as satiety signals (Flood et al., 1990). The hormone cholecystokinin (CCK) is one satiety signal that causes people to limit the amount of food they eat during a meal (Bray, 1991).

We are pushed to eat not only by our hunger drive within. There are also external factors that stimulate hunger.

Other Factors Influencing Hunger: External Eating Cues

What are some non-biological factors that influence what and how much we eat?

Smell that coffee brewing. Look at that mouth-watering chocolate cake. Listen to the bacon sizzling in the morning. Apart from our internal hunger, there are external factors influencing what, where, and how much we eat. Sensory cues such as the taste, smell, and appearance of food stimulate the appetite. For many, the hands

Image omitted due to copyright restrictions.

Just the sight of mouth-watering foods can make us want to eat, even when we aren't actually hungry.

primary drive: A state of tension or arousal arising from a biological need; one not based on learning.

lateral hypothalamus (LH): The part of the hypothalamus that supposedly acts as a feeding centre and, when activated, signals an animal to eat; when the LH is destroyed, the animal refuses to eat.

ventromedial hypothalamus (VMH): The part of the hypothalamus that presumably acts as a satiety centre and, when activated, signals an animal to stop eating; when the area is destroyed, the animal overeats, becoming obese.

of the clock alone, signalling mealtime, are enough to prompt a quest for food. And when we eat with other people, we tend to eat more than when we are eating alone (de Castro & de Castro, 1989).

Susceptibility to External Eating Cues: Can You Resist Them?

Are we all equally susceptible to such external eating cues? Psychologist Judith Rodin (1981) has shown that our responsiveness to internal or external cues does not strongly correlate with the degree of overweight. But external cues *can* trigger internal processes that motivate a person to eat. The sight and smell of appetizing food can trigger the release of insulin, particularly in those who are externally responsive (Rodin et al., 1977). Even in rats, environmental cues previously associated with food cause an increase in insulin levels (Detke et al., 1989). For some individuals, “simply seeing and thinking about food” can cause an elevated level of insulin. Such people have a greater tendency to gain weight (Rodin, 1985).

The Palatability of Food: Tempting Tastes

How good a particular food tastes—that is, how palatable the food is—seems to work somewhat independently of hunger and satiety in determining how much we eat (Rogers, 1990); otherwise, most of us would refuse the pie after eating a big dinner.

Foods that are sweet and high in fat tend to stimulate the human appetite (Ball & Grinker, 1981),

even when the sweetness is provided by artificial sweeteners (Blundell et al., 1988; Tordoff, 1988). Figure 9.3 summarizes the factors that stimulate and inhibit eating.

Understanding Body Weight: Why We Weigh What We Weigh

What are some factors that account for variations in body weight?

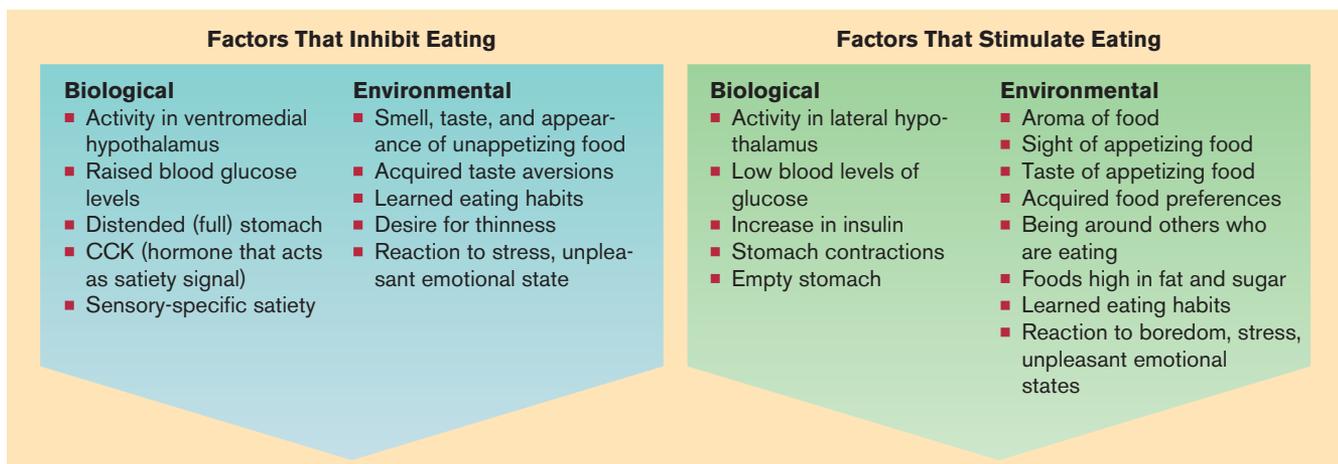
Pencil-thin models seen in television commercials and fashion magazines have come to represent

the ideal body for many women. But most of these models have only 10 to 15 percent body fat, far below the 22 to 26 percent considered normal for women (Brownell, 1991). Fat has become a negative term, even though some body fat is necessary. Men need 3 percent and women 12 percent just for survival. And in order for a woman’s reproductive system to function properly, she must maintain 20 percent body fat. Of course, there is a range of weight that is considered healthy and this range varies according to height, as illustrated in Figure 9.4.

Extremes in either fatness or thinness can pose health risks. An abnormal desire for thinness can result in eating disorders such as anorexia nervosa (self-starvation) and bulimia nervosa (a pattern of bingeing and purging). Read the *Apply It!* box later in this chapter for more details on eating disorders. At the other extreme are those Canadians—perhaps as many as one-third (Flegal, 1996)—who suffer from obesity, which increases the risk of high blood pressure, coronary heart disease, stroke, and cancer (Whelan & Stare, 1990). The term **obesity** means excessive fat-

FIGURE 9.3

Factors That Inhibit and Stimulate Eating Both biological and environmental factors combine to inhibit or to stimulate eating.



ness and is applied to men whose body fat exceeds 20 percent of their weight and to women whose body fat exceeds 30 percent (Williams, 1986).

The Role of Genetic Factors in Body Weight

Studies of adopted children and twins reveal the strong influence of heredity on body size (Bouchard, 1997; de Castro, 1998). Genes are particularly likely to be involved when obesity begins before age 10 (Price et al., 1990). Across all weight classes, from very thin to very obese, children adopted at birth tend to resemble their biological parents more than their adoptive parents in body size (Price et al., 1987; Stunkard et al., 1990). Still, environmental characteristics and lifestyle make an even stronger contribution than the genes to overall body mass (Bouchard, 1997).

Researchers have discovered a gene in rats that leads to gross obesity when mutated—a gain of up to three times normal weight (Friedman & Ramirez, 1994). The normal gene may produce a protein that

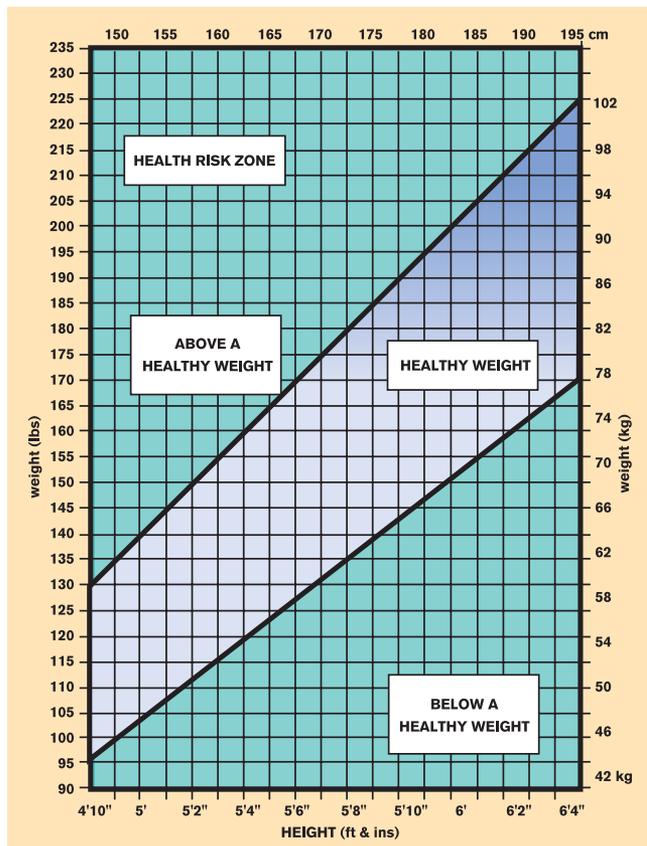
keeps weight under control. Could there be a similar gene in humans? Yes, say the researchers, who have also found a gene in humans that produces a protein very similar to the one produced by the rat gene. A mutation of this receptor gene can cause obesity as well as pituitary abnormalities (Clément et al., 1998).

Metabolic Rate: Burning Energy—Slow or Fast

The term *metabolism* refers to all the physical and chemical processes that are carried out in the body to sustain life. Food provides the energy required to carry out these processes. The rate at which the body burns calories to produce energy is called the **metabolic rate**. Physical activity uses up only about one-third of our energy; the other two-thirds is consumed by the maintenance processes that keep us alive (Shah & Jeffery, 1991). When there is an imbalance between energy intake (how much we eat) and output (how much energy we use), our weight changes. If our calorie intake exceeds our daily energy requirement, we gain weight. If our daily energy requirement exceeds our caloric intake, we lose weight.

Fat-Cell Theory: Tiny Storage Tanks for Fat

Fat-cell theory proposes that fatness is related to the number of **fat cells** in the body. It is estimated that each of us has between 30 and 40 billion fat cells (adipose cells) and that the number is determined by both our genes and our eating habits (Bennett & Gurin, 1982; Grinker, 1982). Fat cells serve as storehouses for liquefied fat. When we lose weight, we do not lose the fat cells themselves. We lose the fat that is stored in them—the cells simply shrink (Dietz, 1989). Also, researchers now believe that when people overeat beyond the point at which the fat cells reach their capacity, the number of fat cells increases (Rodin & Wing, 1988).



Set-Point Theory: Thin/Fat Thermostat

How does set point affect body weight?

Set-point theory suggests that humans and other mammals are genetically programmed to carry a certain amount of body weight (Keeseey, 1988). **Set point** is affected by the number of fat cells in the body and by metabolic rate, both of which are influenced by the genes (de Castro, 1993; Gurin, 1989).

According to set-point theory, an internal homeostatic system functions to maintain set-point weight, much as a thermostat works to keep temperature near the point at which it is set. Whether we are lean, overweight, or average, when our weight falls below our set point, our appetite increases. When our weight climbs above our set point, our appetite decreases so as to restore the original weight.

The theory also holds that our rate of energy expenditure adjusts to maintain the body's set-point weight (Keeseey & Powley, 1986). When people gain weight, their metabolic rate increases (Dietz, 1989). When people restrict calories to lose weight, their metabolic rate *decreases*; this causes the body to burn fewer calories, which in turn makes further weight loss more difficult. Increasing the amount of physical activity is the one method recommended for lowering the set point so that the body will store less fat (Foreyt et al., 1996).

Social Motives

What is Murray's contribution to the study of motivation?

Do you have a strong need to be with other people (affiliation), or a need for power, or a need for achievement? These needs are three examples of **social motives**, which we learn or acquire through social and cultural experiences. Each of us differs in the strength of various social motives and in the priorities we assign to them. Our highest aspirations, the professions we choose, the partners we are drawn to, and the methods we use to achieve our sense of importance result primarily from our social motives.

In 1938 Henry Murray drew up a list of social motives or needs, which included the needs for achievement, recognition, affiliation, dominance, and order. Murray believed that people have social motives in varying degrees. To investigate the strength of those various needs, Murray (1938) developed the **Thematic Apperception Test (TAT)**, which consists of a series of pictures of ambiguous situations. People are asked to write a story about each picture—to describe what is going on in the picture, what the person or persons pictured are thinking about, what they may be feeling, and what is likely to be the outcome of the situation. The stories are presumed to reveal the individual's needs and the strength of those

Remember It!

The Primary Drives: Hunger and Thirst

- Body cells lose water and become dehydrated when an individual
 - perspires heavily.
 - consumes too much salt.
 - has diarrhea or vomiting.
 - drinks too much alcohol.
- The lateral hypothalamus (LH) acts as a (feeding/satiety) centre; the ventromedial hypothalamus (VMH) acts as a (feeding/satiety) centre.
- All of the following are hunger signals *except*
 - activity in the lateral hypothalamus.
 - low levels of glucose in the blood.
 - the hormone CCK.
 - high insulin level.
- Foods that are sweet and high in fat tend to stimulate the appetite. (true/false)
- Which factor is most responsible for how fast your body burns calories to produce energy?
 - set point
 - fat cells
 - eating habits
 - metabolic rate
- According to set-point theory, the body works to (increase/decrease/maintain) body weight.
- Fat cells never decrease in number. (true/false)
- Increased exercise during dieting is important to counteract the body's tendency to
 - increase the fat in the fat cells.
 - increase the number of fat cells.
 - lower its metabolic rate.
 - raise its metabolic rate.

Answers: 1. b 2. feeding, satiety 3. c 4. true 5. d 6. maintain 7. true 8. c

needs. The TAT has also been used as a more general personality test.

The Need for Achievement: The Drive to Excel

What is the need for achievement?

Both men and women are driven by social motives. Among these is the **need for achievement**, defined by Murray (1938) as the need “to accomplish something difficult.... To overcome obstacles and attain a high standard. To excel one’s self” (p. 164). This need has been researched vigorously. Unfortunately, the participants in these studies have been almost exclusively male (McClelland, 1958, 1961, 1985).

Atkinson’s Theory of Achievement Motivation: When Do We Try?

Atkinson (1964) suggests that when we approach any situation, two conflicting factors are operating—our hope for success and our fear of failure. Motivation to avoid failure can cause us to work harder at a task to try to ensure success, or it can cause us to avoid the task altogether.

Whether you strive for a goal depends on three factors: (1) the strength of your need to achieve, (2) your expectation of success, and (3) the incentive value of success or failure at a particular activity—that is, how much you value success in the activity and how distressed you would be if you failed at it (Wigfield & Eccles, 2000). For example, whether you try to achieve an A in psychology will depend on how important an A is to you, on whether you believe an A is possible, and on how much pride you will feel in getting an A as opposed to how upset you will be if you do not.

Image omitted due to copyright restrictions.

People with a high need for achievement can overcome even serious disabilities in their efforts to succeed.

Complete *Try It!*, which describes a game that is said to reveal high or low achievement motivation.

Try It!

Test Your Need for Achievement

Imagine yourself involved in a ring-toss game. You have three rings to toss at any of the six pegs pictured here. You will be paid a few pennies each time you are able to ring a peg.

Which peg would you try to ring with your three tosses—peg 1 or 2 nearest you, peg 3 or 4 at a moderate distance, or peg 5 or 6 at the far end of the room?



set point: The weight the body normally maintains when one is trying neither to gain nor to lose weight (if weight falls below the normal level, appetite increases and metabolic rate decreases; if weight is gained, appetite decreases and metabolic rate increases so that the original rate is restored).

social motives: Motives acquired through experience and interaction with others (examples: need

for achievement, need for affiliation).

Thematic Apperception Test (TAT): A projective test consisting of drawings of ambiguous human situations, which the subject describes; thought to reveal inner feelings, conflicts, and motives.

need for achievement: The need to accomplish something difficult and to perform at a high standard of excellence.

Characteristics of Achievers: Successful People Have Them

What are some characteristics shared by people who are high in achievement motivation?

McClelland and colleagues (1953) found that high achievers differ from low achievers in several ways. People with a high achievement motivation tend to set goals of moderate difficulty. They pursue goals that are challenging yet attainable with hard work, ability, determination, and persistence. Goals that are too easy—that anyone can reach—offer no challenge and hold no interest, because success would not be rewarding (McClelland, 1985). Impossibly high goals and high risks are also not pursued, because they offer little chance of success and are considered a waste of time.

People with a low need for achievement are not willing to take chances when it comes to testing their own skills and abilities. They are motivated more by their fear of failure than by their hope and expectation of success. This is why they set either ridiculously low goals, which anyone can attain, or else impossibly high goals (Geen, 1984). After all, who can fault a person for failing to reach a goal that is impossible for almost anyone?

In view of this description, which peg in the ring toss game in *Try It!* would people low in achievement motivation try for? If you guessed peg 1 or 2, or peg 5 or 6, you are right. People low in achievement motivation are likely to stand right over peg 1 so they can't possibly fail. Or they may toss the rings at peg 6, hop-

ing they might get lucky. People with a high need for achievement tend to toss their rings at peg 3 or 4, an intermediate distance that offers some challenge. Which peg did you aim for?

People with high achievement motivation see their success as a result of their own talents, abilities, persistence, and hard work (Kukla, 1972). They typically do not credit luck or the influence of other people for their successes; nor do they blame luck or other people for their failures. When individuals with low achievement motivation fail, they usually give up quickly and attribute their failure to lack of ability. They also believe that luck or fate, rather than effort, is responsible for accomplishment (Weiner, 1972, 1974).

Developing Achievement Motivation: Can We Learn It?

If achievement motivation, like the other social motives, is primarily learned, *how* is it learned? Some experts believe that child-rearing practices and values in the home are important factors in developing achievement motivation (McClelland, 1985; McClelland & Pilon, 1983). Parents may be more likely to have children with high achievement motivation if they give their children responsibilities, stress independence when the children are young, and praise them sincerely for genuine accomplishments (Ginsburg & Bornstein, 1993; Gottfried et al., 1994). Birth order appears to be related to achievement motivation; first-born and only children show a higher

Social Motivation

1. Social motives are, for the most part, unlearned. (true/false)
2. According to Atkinson's theory of achievement motivation, which of the following is *not* a major factor in determining whether an individual approaches a goal?
 - a. the strength of the individual's need to achieve
 - b. the person's expectation of success
 - c. how much pride the person has in achieving the goal as opposed to how upsetting failure would be
 - d. the financial reward attached to the goal
3. Which of these statements is *not* true of people high in achievement motivation?
 - a. They set very high goals for which success will be extremely difficult to obtain.
 - b. They set goals of moderate difficulty.
 - c. They attribute their success to their talents, abilities, and hard work.
 - d. They are likely to choose careers as entrepreneurs.

Answers: 1. false 2. d 3. a

need for achievement than younger siblings (Falbo & Polit, 1986). Younger siblings, however, tend to be more sociable and likable than first-born or only children, and this has its rewards too.

The What and Why of Emotions

Motivation and Emotion: What Is the Connection?

Motivation does not occur in a vacuum. Much of our motivation to act is fuelled by our emotional state. In fact, the root of the word **emotion** means “to move,” indicating the close relationship between motivation and emotion. When we observe the emotion of sadness in another, we often feel empathy, and this may motivate us to acts of altruism (helping behaviour). Fear motivates us either to flee (to escape danger) or to perform protective behaviours that provide security and safety (Izard, 1992). Emotions prepare and motivate us to respond adaptively to a variety of situations in life. They enable us to communicate our feelings and intentions more effectively than we could with words alone; thus, they make it more likely that others will respond to us. But what, precisely, are emotions?

The Components of Emotions: The Physical, the Cognitive, and the Behavioural

What are the three components of emotions?

What are emotions—nothing more than feelings? Is that what emotions are? We say that we feel lonely or sad, happy or content, or angry, embarrassed, or afraid. Most people describe emotions in terms of feeling states; psychologists, however, study emotions according to their three components—physical, cognitive, and behavioural.

The *physical* component is the physiological arousal (the internal body state) that accompanies the emotion. Without the physiological arousal, we would not feel the emotion in all its intensity. The surge of powerful feeling we know as emotion is due largely to the physiological arousal we experience.

The *cognitive* component, the way we perceive or interpret a stimulus or situation, determines the

IT HAPPENED IN CANADA

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Canadians' Outpouring of Emotions

Canadians often perceive themselves to be well in control of their emotions. It is part of the traditional norms of many Canadians to act calmly and rationally when faced with sad or potentially upsetting events. Our reserved nature is especially pronounced when we are in the presence of others. But some events are out of the ordinary and, since the beginning of the year 2000, a few such events have definitely touched many of us.

In the spring of 2000, Maurice “le Rocket” Richard passed away. Richard was a well-loved and admired hockey legend who broke many records during his playing days with the Montreal Canadiens in the 1940s and 1950s. Following the announcement of his death, over 110 000 people came forward to mourn. Crowds overflowed the Notre-Dame Basilica in Montreal, with more than 2000 people lining the street in front of the church. Several times during the funeral service, many of the 2700 mourners dissolved into tears. For days after his death, the media reviewed the life and achievements of one of Canada’s most respected hockey greats (Bird, 2000).

Near the end of the summer, Canadians were informed of another sad event of national proportion. Pierre Elliot Trudeau, who many believed to be Canada’s most influential prime minister, died after a prolonged illness. Tens of thousands of Canadians visited Parliament Hill and waited as long as four hours to pay their respects. Thousands sent flowers; many wrote highly personal comments to thank Mr. Trudeau for his vision and the impact he had on their lives (McKinnon, 2000). Trudeau’s death clearly struck a chord with many Canadians. Conversations in restaurants, at work, and on the radio and television were filled with anecdotes and stories about how Mr. Trudeau’s spirit affected Canadians personally and changed the country as a whole (Winsor, 2000).

In both these stories, the outpouring of emotions was likely beneficial to all those who were touched by the lives of Mr. Richard and Mr. Trudeau. It is perhaps time to reconsider our perceptions of Canadians as reserved and generally unemotional, as touching events will clearly affect us all.

emotion: A feeling state involving physiological arousal, a cognitive appraisal of the situation arousing the state, and an outward expression of the state.

TABLE 9.2**The Components of Emotions**

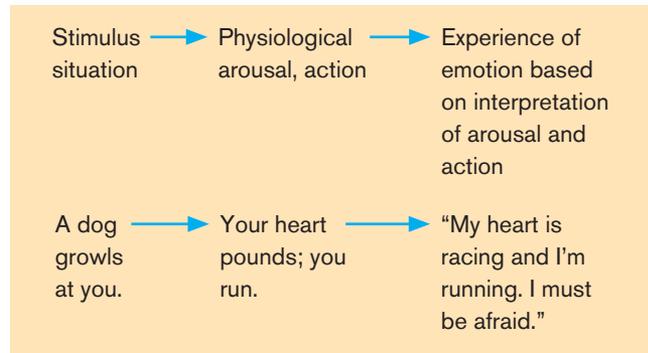
Physical Component	Cognitive Component	Behavioural Component
Physiological arousal (internal bodily state accompanying the emotion).	The way we interpret a stimulus or situation.	Outward expression of the emotion (facial expressions, gestures, body posture, tone of voice).

specific emotion we feel. If you are home alone and the wind is banging a tree limb on your roof, you may become fearful if you perceive the knocking and the banging as a burglar trying to break into your house. An emotional response to an imaginary threat is every bit as powerful as a response to a real threat. Perceptions make it so. Have you ever worked yourself into a frenzy before a first date, a job interview, or an oral presentation for one of your classes? Then your thinking was contributing to your emotional state.

The *behavioural* component of emotions is the outward expression of the emotions. Our facial expressions, gestures, body posture, and tone of voice stem from and convey the emotions we are feeling within. Some of the facial expressions that accompany emotion are innate and are the same across cultures. But some of our emotional expressions are more influenced by our culture and its rules for displaying emotion. Table 9.2 summarizes the components of emotions.

Theories of Emotion: Which Comes First, the Thought or the Feeling?

There is no doubt that we react to certain experiences with emotion. For example, if you think you are making a fool of yourself in front of your friends, the emotion you feel is embarrassment, which triggers a physiological response that may cause you to blush. This type of reaction seems logical—it seems to fit our everyday experience. But is this sequence of events the course that an emotional experience really follows?

**FIGURE 9.5****The James-Lange Theory of Emotion**

The James-Lange theory of emotion is the exact opposite of what

our subjective experience tells us. If an angry dog

growls at you, the James-Lange interpretation is this:

The dog growls, your heart begins to pound, and only by

observing that your heart is pounding do you conclude

that you must be afraid.

LINK IT!

emotion.salk.edu/emotion.html

Emotion Home Page

The James-Lange Theory

According to the James-Lange theory, what sequence of events occurs when we experience an emotion?

William James (1884) argued that the sequence of events in an emotional experience is exactly the reverse of what our subjective experience tells us.

James believed that first an event causes physiological arousal and a physical response. Only then do we perceive or interpret the physical response as an emotion. In other words, saying something stupid causes us to blush, and we interpret our physical response, the blush, as an emotion, embarrassment. James (1890) went on to suggest that “we feel sorry *because* we cry, angry *because* we strike, afraid *because* we tremble” (p. 1066).

At about the same time that James proposed his theory, a Danish physiologist and psychologist, Carl Lange, independently formulated nearly the same theory. Hence, we have the **James-Lange theory** of emotion (Lange & James, 1922). The theory suggests that different patterns of arousal in the autonomic nervous system produce the different emotions we

feel, and that the physiological arousal appears before the emotion is perceived. See Figure 9.5.

If the physical arousal itself were the sole cause of what we know as emotion, however, there would have to be a distinctly different set of physical changes associated with each emotion. Otherwise we wouldn't know whether we were sad, embarrassed, frightened, or happy.

The Cannon-Bard Theory

What is the Cannon-Bard theory of emotion?

An early theory of emotion that challenged the James-Lange theory was proposed by Walter Cannon (1927), who claimed that the bodily changes caused by the various emotions are not sufficiently distinct to allow people to distinguish one emotion from another.

Physiologist Philip Bard (1934) later expanded Cannon's original theory. The **Cannon-Bard theory** suggests that the following chain of events occurs when we feel an emotion: Emotion-provoking stimuli are received by the senses and are then relayed simultaneously to the cerebral cortex, which provides the conscious mental experience of the emotion, and the sympathetic nervous system, which produced the physiological state of arousal. In other words, your feeling of emotion (e.g., fear) occurs at about the same time that you experience physiological arousal (e.g., pounding heart). One does not cause the other.

The Schachter-Singer Theory

According to the Schachter-Singer theory, what two things must occur in order for us to experience an emotion?

Stanley Schachter looked at these early theories of emotion and concluded that they left out a critical component—our own cognitive interpretation of why we become aroused. Schachter and Singer (1962) proposed a two-factor theory. According to the **Schachter-Singer theory**, two things must happen for a person to feel an emotion: (1) The person must first experience physiological arousal. (2) Then there must be a cognitive interpretation or explanation of the physiological arousal so that the person can label it as a specific emotion. Thus, according to this theory, a true emotion can occur only if we are physically aroused and can find some reason for it. However, attempts to replicate the findings of Schachter and Singer have been largely disappointing (Marshall & Zimbardo, 1979).

The Lazarus Cognitive-Appraisal Theory

According to Lazarus, what sequence of events occurs when an individual feels an emotion?

Richard Lazarus (1991a, 1991b, 1995) has proposed a theory of emotion that most heavily emphasizes cognition. According to the

Lazarus theory of emotion, a cognitive appraisal is the first step in an emotional response, and all other aspects of an emotion, including physiological arousal, depend on the cognitive appraisal. Contrary to what Schachter and Singer proposed, Lazarus believes that when faced with a stimulus or event, a person first appraises it. This cognitive appraisal determines whether the person will have an emotional response and, if so, what type of response it should be. The physiological arousal and all other aspects of the emotion flow from the appraisal. In short, Lazarus contends that emotions are provoked when cognitive appraisals of events are positive or negative—but not neutral.

Critics of the Lazarus theory point out that some emotional reactions are instantaneous—occurring too rapidly to pass through cognitive appraisal (Zajonc, 1980, 1984, 1998). Lazarus (1991b) responds that some mental processing occurs without conscious awareness, and that there must be some form of cognitive realization, however brief, or else a person would not know what he or she is supposed to feel. This issue is still hotly debated among experts. What do you think? Do emotions or cognitions come first?

Review & Reflect 9.2 summarizes the four major theories of emotion: James-Lange, Cannon-Bard, Schachter-Singer, and Lazarus.

James-Lange theory: The theory that emotional feelings result when we become aware of our physiological response to an emotion-provoking stimulus (in other words, we are afraid because we tremble).

Cannon-Bard theory: The theory that physiological arousal and the feeling of emotion occur simultaneously after an

emotion-provoking stimulus is relayed to the thalamus.

Schachter-Singer theory: A two-stage theory stating that for an emotion to occur, there must be (1) physiological arousal and (2) an explanation for the arousal.

Lazarus theory: The theory that an emotion-provoking stimulus triggers a cognitive appraisal, which is followed by the emotion and the physiological arousal.

The Expression of Emotion

Expressing emotions comes as naturally to humans as breathing. No one has to be taught how to smile or frown, or how to express fear, sadness, surprise, or disgust. Only actors practise making the facial expressions to convey various emotions. And the facial expressions of the basic emotions are much the same across human cultures all over the world.

The Range of Emotion: How Wide Is It?

What are basic emotions?

How many emotions are there? The number of emotions people list depends on their culture, the language they speak, and other factors. Two leading researchers in the field, Paul Ekman (1993) and Carroll Izard (1992), insist that there are a limited number of basic emotions. **Basic emotions** are unlearned and universal—that is, they are found in all cultures, are reflected in the same

REVIEW & REFLECT 9.2

Theories of Emotion

Theory	View	Example
James-Lange Theory	An event causes physiological arousal. We experience an emotion only after we interpret the physical response.	You are walking home late at night and hear footsteps behind you. Your heart pounds and you begin to tremble. You interpret these physical responses as fear.
Cannon-Bard Theory	An event causes a physiological <i>and</i> an emotional response simultaneously. One does not cause the other.	You are walking home late at night and hear footsteps behind you. Your heart pounds, you begin to tremble, <i>and</i> you feel afraid.
Schachter-Singer Theory	An event causes physiological arousal. We must then be able to identify a reason for the arousal in order to label the emotion.	You are walking home late at night and hear footsteps behind you. Your heart pounds and you begin to tremble. You know that walking alone at night can be dangerous, and so you feel afraid.
Lazarus Theory	An event occurs, a cognitive appraisal is made, and then the emotion and physiological arousal follow.	You are walking home late at night and hear footsteps behind you. You think it could be a mugger. So you feel afraid, and your heart starts to pound and you begin to tremble.

Theories of Emotion

- According to the text, emotions have all of the following *except* a _____ component.
 - physical
 - cognitive
 - sensory
 - behavioural
- Which theory of emotion holds that we feel a true emotion only when we become physically aroused and can identify some cause for the arousal?
 - Schachter-Singer theory
 - James-Lange theory
 - Cannon-Bard theory
 - Lazarus theory
- Which theory of emotion suggests that we feel fearful *because* we were shaking?
 - Schachter-Singer theory
 - James-Lange theory
 - Cannon-Bard theory
 - Lazarus theory
- Which theory suggests that our feeling of an emotion and our physiological response to an emotional situation occur at about the same time?
 - Schachter-Singer theory
 - James-Lange theory
 - Cannon-Bard theory
 - Lazarus theory

Answers: 1. c 2. a 3. b 4. c

facial expressions, and emerge in children according to their own biological timetable of development. Fear, anger, disgust, surprise, joy or happiness, and sadness or distress are usually considered basic emotions. Izard (1992, 1993) suggests that there are distinct neural circuits that underlie each of the basic emotions; and Levenson and colleagues (1990) point to specific autonomic nervous system activity associated with the basic emotions. Panksepp (1992; Panksepp et al. 1998) believes there is strong evidence that emotional systems in the brain underlie at least these: rage, fear, expectancy, and panic. Not all researchers, however, subscribe to the notion of basic emotions (Turner & Ortony, 1992).

Ekman (1993, 1999) suggests that we consider studying emotions as families. Clearly there are gradients, or degrees, of intensity within a single emotion. For example, people experience fear in various degrees, from mild uneasiness to outright terror. Anger as a “family” could range from annoyance to irritation to rage. It could also include resentment, outrage, and vengefulness.

Obviously, the facial expression for annoyance is quite different from the facial expression for rage. But can you imagine 60 different facial expressions for the different types and intensities of anger? Ekman and Friesen identified 60 anger expressions; each was different from the others but all shared the basic properties of the face of anger (Ekman, 1993). Just as there are many words in our vocabulary to describe the variations in any emotion, there are subtle distinctions in the facial expression of a single emotion that convey its intensity.

How do we learn to express our emotions? Or *do* we learn? There is considerable evidence that the basic emotions (fear, anger, sadness, happiness, disgust, and surprise), or the facial expressions we make when we feel them, are biologically rather than culturally determined.

The Development of Facial Expressions in Infants: Smiles and Frowns Come Naturally

How does the development of facial expressions of different emotions in infants suggest a biological basis for emotional expression?

According to the biological timetable of maturation (Greenberg, 1977), facial expressions of emotions develop naturally, just

as do the motor skills of crawling and walking. By three months, babies can express happiness and sadness (Lewis, 1995), and laughter appears somewhere around three and a half to four months (Provine, 1996). Between the ages of four and six months, the emotions of anger and surprise appear, and by about seven months, infants show fear. The self-conscious emotions do not emerge until later. Between 18 months and three years, children begin to show first empathy, envy, and embarrassment, followed by shame, guilt, and pride (Lewis, 1995).

Another strong indication that the facial expressions of emotion are biologically determined, rather than learned, comes from studies done on children who were blind and deaf from birth. Their smiles and frowns, their laughter and crying, and their facial expressions of anger, surprise, and pouting were the same as those of children who could hear and see (Eibl-Eibesfeldt, 1973).

Although recent studies have contributed much to our understanding of facial expressions, the biological connection between emotions and facial expressions was proposed many years ago, as described in the next *World of Psychology* box.

Cultural Rules for Displaying Emotion

While the facial expressions of the basic emotions are much the same in cultures around the world, cultures can have very different **display rules**—cultural rules that dictate how emotions should generally be expressed and where and when their expression is appropriate (Ekman, 1993; Ekman & Friesen, 1975; Scherer & Wallbott, 1994). Society often expects us to give evidence of certain emotions that we may not actually feel. We are expected to be sad at funerals, to hide our disappointment when we lose, and to refrain from showing disgust if the food we are served tastes bad to us. In one study, Cole (1986) found that three-year-old girls, when given an unattractive gift, smile nevertheless. They have learned the display

basic emotions: Emotions that are found in all cultures, that are reflected in the same facial expressions across cultures, and that emerge in children according to their biological timetable (e.g., anger,

disgust, happiness, sadness, distress).

display rules: Cultural rules that dictate how emotions should be expressed, and when and where their expression is appropriate.

WORLD OF PSYCHOLOGY

Facial Expressions for the Basic Emotions: A Universal Language

The relationship between emotions and facial expressions was first studied by Charles Darwin (1872, 1965). He believed that the facial expression of emotion was an aid to survival in that it enabled people, before they developed language, to communicate their internal states and react to emergencies. Darwin maintained that most of the emotions we feel and the facial expressions that convey them are genetically inherited and characteristic of the entire human species. To test his belief, he asked missionaries and people of different cultures around the world to record the facial expressions that accompany the basic emotions. On the basis of those data, he concluded that facial expressions were similar across cultures.

In some cases, modern research supports Darwin's view that facial

expressions are universal (Ekman & Friesen, 1971). More recent research, however, suggests that cultural differences do exist.

Ekman and Friesen showed photographs portraying facial expressions of the primary emotions—sadness, surprise, happiness, anger, fear, and disgust—to members of the Fore tribe in a remote area in New Guinea. The Fore people were able to identify the emotional expressions of happiness, sadness, anger, and disgust; however, they had difficulty distinguishing fear and surprise.

Ekman then had the tribespeople make faces to reflect the same emotional expressions, and he videotaped them. The tapes were shown to students in the United States, who could readily identify the emotions portrayed

except for the same two expressions that had posed a problem for the Fore—surprise and fear.

Recent studies by James Russell (1993, 1994) at the University of British Columbia suggest that for some facial expressions, recognition varies between cultures. For example, the facial expressions that Canadian participants recognized as fear were perceived as surprise by Japanese participants, although most participants agreed on which faces were happy. Russell argues that the differences in some of the “primary” emotions show that culture may affect how we interpret facial expressions; this conflicts with Darwin's idea that facial expressions are a genetic trait shared by all humans.

Do Ekman's test in *Try It!* and see if you can identify the faces of emotion.

rules and signal an emotion that they very likely do not feel. Davis (1995) found that among first to third graders, girls were better able to hide disappointment than were boys. Gender differences in display rules have been reported with some consistency in a variety of contexts (Brody, 2000).

Different cultures, neighbourhoods, and even families may have very different display rules. Display rules in Japanese culture dictate that negative emotions must be disguised when others are present (Ekman, 1972; Triandis, 1994). In many Western societies, women are expected to smile often, whether they feel happy or not. And in East Africa, young males from traditional Masai society are expected to appear stern and stony-faced and to “produce long, unbroken stares” (Keating, 1994). It appears that much of our communication of emotion is not authentic, not truly felt.

Most of us learn display rules very early and abide by them most of the time. Yet we may not be fully

aware that the rules we have learned dictate where, when, how, and even how long certain emotions should be expressed.

Emotion as a Form of Communication

Why is emotion considered a form of communication?

Emotions enable us to communicate our feelings, intentions, and needs more effectively than

just words alone; thus they make it more likely that others will respond to us. And researchers maintain that not only are we biologically wired to convey certain emotion signals, but we are biologically predisposed to read and interpret them as well (Dimberg, 1990; Oatley & Jenkins, 1992).

By communicating emotions, we motivate others to act. When we communicate sadness or distress, people close to us are likely to be sympathetic and to try to help us. By expressing emotions, infants com-

Try It!



Identifying Facial Expression of Emotion

Look carefully at the six photographs. Which basic emotion is portrayed in each?

Match the number of the photograph with the basic emotion it portrays:

- | | | |
|--------------|----------|-------------|
| a. happiness | c. fear | e. surprise |
| b. sadness | d. anger | f. disgust |

 1. _____	 2. _____	 3. _____
 4. _____	 5. _____	 6. _____

Answers: 1. d 2. c 3. f 4. e 5. a 6. b

municate their feelings and needs before they can speak. In an early study, Katherine Bridges (1932) observed emotional expression in Canadian infants over a period of months. She reported that the first emotional expression to appear is that of distress, which occurs at three weeks. In terms of survival, the expression of distress enables helpless newborns to get the attention of their caretakers so that their needs can be met.

Do you feel happier when you are around others who are happy? You may already know that emotions are contagious. Infants will usually begin to cry when they hear another infant cry. Your own emotional expressions can infect others with the same emotion.

Image omitted due to copyright restrictions.

The stern faces of these two young Masai warriors from Kenya reflect their culture's display rules banning the public expression of emotion.

Parents seem to know this intuitively when they display happy expressions to infect their babies with happy moods (Keating, 1994). Researchers have found that mothers in many cultures—Trobriand Island, Yanomamo, Greek, German, and Japanese—attempt to regulate the moods of their babies through facial communication of emotions (Kanaya et al., 1989; Keller et al., 1988; Termine & Izard, 1988).

From as early as our first year of life, we perceive the emotions of others and use this information to guide our own behaviour (Sternberg & Hagekull, 1997). Infants pay close attention to the facial expressions of others, especially their mother. And when they are confronted with an ambiguous situation, they use the mother's emotion as a guide to whether they should approach or avoid the situation. This phenomenon is known as *social referencing* (Klinnert et al., 1983).

In fact, by adulthood, we become very sensitive to even subtle cues. For example, Gosselin and colleagues (1995, 1997), at the University of Ottawa, demonstrated that adults can often tell the difference between actors just acting an emotion and actors truly experiencing an emotion.

LINK IT!

www.hc.t.u-tokyo.ac.jp/~jikken/index-e.html

Home Page of the Facial Image Processing World

mambo.ucsc.edu/ps1/fanl.html
Facial Analysis Resources



Expressing Emotion

- All of the following are true of the basic emotions *except* that
 - they are reflected in distinctive facial expressions.
 - they are found in all cultures.
 - there are several hundred known to date.
 - they are unlearned.
- Which of the following is *not* one of the emotions represented by a distinctive facial expression?
 - happiness
 - hostility
 - surprise
 - sadness
- Facial expressions associated with the basic emotions develop naturally according to a child's own biological timetable of maturation. (true/false)
 - are the same in all cultures.
 - dictate when and where emotions should be expressed.
 - dictate what emotions should not be expressed.
 - often cause people to display emotions they do not feel.
- Which of the following statements is *not* true about emotion as a form of communication?
 - Emotions communicate our feelings better than just words alone.
 - Emotions communicate our intentions.
 - Emotions are often contagious.
 - Infants under one year of age are unable to use the emotions of others to guide their behaviour.

Answers: 1. c 2. b 3. true 4. a 5. d

Experiencing Emotion

How are expressions of emotion related to our experience of emotion? Some researchers go so far as to suggest that the facial expression alone can actually produce the experience.

The Facial-Feedback Hypothesis: Does the Face Cause the Feeling?

What is the facial-feedback hypothesis?

Sylvan Tomkins (1962, 1963) suggested that facial expressions of the basic emotions are genetically programmed. But he went a step further: he asserted that the facial expression itself—that is, the movement of the facial muscles producing the expression—triggers both the physiological arousal and the conscious feeling associated with the emotion. The notion that the muscular movements involved in certain facial expressions produce the corresponding emotion is called the **facial-feedback hypothesis** (Izard, 1971, 1977, 1990; Strack et al., 1988).

In an extensive review of research on the facial-feedback hypothesis, Adelmann and Zajonc (1989) found impressive evidence to support an association between facial expression and the subjective experi-

ence of the emotion. In addition, they found considerable support for the notion that simply the act of making the facial expression can initiate the subjective feeling of the emotion.

The Simulation of Facial Expressions: Put On a Happy Face

Over 125 years ago, Darwin (1872, 1965) wrote, “Even the simulation of an emotion tends to arouse it in our minds” (p. 365). Ekman and colleagues (1983) put this notion to the test using 16 participants (12 professional actors and 4 scientists). They were guided to contract specific muscles in the face so that they could assume the facial expressions of six basic emotions—surprise, disgust, sadness, anger, fear, and happiness. However, they were never actually told to smile, frown, or put on an angry face.

They were hooked up to electronic instruments, which monitored changes in heart rate, skin response (to measure perspiring), muscle tension, and hand temperature. Measurements were taken as they made each facial expression. While hooked up to the devices, the participants were also asked to imagine or relive six actual experiences in which they had felt each of the six emotions.

Ekman reported that a distinctive physiological response pattern emerged for the emotions of fear,

sadness, anger, and disgust, whether the participants relived one of their emotional experiences or simply made only the corresponding facial expression. In fact, in some cases the physiological measures of emotion were greater when the actors and scientists made the facial expression than when they imagined an actual emotional experience (Ekman et al., 1983). The researchers found that both anger and fear accelerate heart rate, and fear produces colder fingers than does anger.

Do you think that making particular facial expressions will affect your emotions? A simple experiment you can try alone or with friends or classmates is described in the next *Try It!* When you hold a pencil between your teeth, you activate the facial muscles used to express happiness. When you hold it between your lips, you activate the muscles involved in the expression of anger.

Try It!



Do Facial Expressions Affect Emotions?



Hold a pencil between your lips with your mouth closed, as shown in the left-hand drawing, for about 15 seconds. Pay attention to your feelings. Now hold the pencil between your teeth, letting your teeth show, as shown in the right-hand drawing, for about 15 seconds.

Did you have more pleasant feelings with the pencil between your lips or your teeth? Why? (Adapted from Strack et al., 1988.)

Controlling Our Facial Expressions to Regulate Our Feelings

If facial expressions can activate emotions, is it possible that intensifying or weakening a facial expression can intensify or weaken the corresponding state of feeling?

Izard (1990) believes that by learning to regulate our own emotional expressions, we may be able to gain control over our emotions. We may learn to change the intensity of an emotion by inhibiting or amplifying its expression, or change the emotion by simulating another emotion. Izard proposes that this might be a useful adjunct to psychotherapy.

Regulating or modifying an emotion by simulating an expression of its opposite may be effective if the emotion is not unusually intense. What is it about intense emotional states that makes them so difficult to control or regulate?

Emotion and Rational Thinking

Have you ever been so “swept away” by emotion that your ability to reason deserted you and you did something you later regretted? Could there be a negative correlation between emotional intensity and objective, rational thinking? The proposition has been posed this way: as emotion intensifies, rational thinking decreases (Brandt-Williams, personal communication, 1994).

Intense emotional states are frequently described in phrases that suggest these states are devoid of rational thinking—“insanely jealous,” “blinded by love,” “frozen with fright,” “consumed by passion,” “burning with envy.” Can you think of examples that would suggest that rational thinking lessens as emotional states intensify?

Some dramatic examples of how extreme emotional states can diminish rational thinking and result in tragedy are major depression resulting in suicide, and rage resulting in spousal abuse, child abuse, or murder. Do the next *Try It!* to find other emotion-causing events that could affect rational thinking.

Emotional experience is a central part of human existence. But do we all, male and female alike, expe-

facial-feedback hypothesis: The idea that the muscular movements involved in certain facial expressions trigger the corresponding emotions (for example, smiling makes us happy).

Try It!



Events That Cause Extreme Emotion

List as many news events as you can that seem to support the notion that when people are consumed by emotion, rational thinking can decrease or disappear, with disastrous consequences.

Event	Extreme Emotion
_____	_____
_____	_____
_____	_____
_____	_____

rience our emotions in identical ways? The *World of Psychology* box addresses this question.

Love: The Strongest Emotional Bond

The emotion of love comes in many varieties. And although we often use the term rather loosely or casually—"I love ice cream," "I love to dance"—it is usually experienced as a deep and abiding affection. We feel love for our parents, for our sisters and brothers, for our children, and ideally for our friends and neighbours and other humans. There is also love of country and love of learning. There seems to be a virtually endless list of people, things, and situations that may produce in humans the emotion of love.

The variety of love most written about by poets, most set to music by composers, and most longed for by virtually all of us is—romantic love.

But the first question to ask is, How many components are there to this thing we call love?

WORLD OF PSYCHOLOGY

Gender Differences in the Experience of Emotion

Do females and males differ significantly in how they experience their emotions? Do women tend to be more intensely emotional than men? Some research suggests that the answer to both questions may be yes (Brody, 2000).

What emotion would you feel first if you were betrayed or criticized harshly by another person? When asked to respond to this hypothetical situation, males were more likely to report they would feel angry, and females were more likely to say they would feel hurt, sad, or disappointed (Brody, 1985).

But the most puzzling gender difference found in emotional experience is the following: In surveys of happiness, women report greater happiness and life satisfaction (Wood et al., 1989); but they also report more sadness, are twice as likely to report being depressed, and admit to greater fear

(Scherer et al., 1986). How can women be both happier and sadder than men? Another gender difference may explain it: researchers have found sex differences in the intensity of emotional response. Grossman and Wood (1993) tested males and females for intensity of emotional response on five basic emotions—joy, love, fear, sadness, and anger. They found that “women reported more intense and

more frequent emotions than men did, with the exception of anger” (p. 1013).

More joy, more sadness, more fear, more love! But these were self-reports. How do we know that the women actually *felt* four of the five emotions more intensely than the males? The researchers also measured physiological arousal. The participants viewed slides depicting the various emotions while they were hooked up to an electromyogram to measure tension in the facial muscles. It was found that “women not only reported more intense emotional experience than men, but they also generated more extreme physiological reactions” (Grossman & Wood, 1993, p. 1020). Other researchers agree that, in general, women respond with greater emotional intensity than men and thus can experience both greater joy and greater sorrow (Fujita et al., 1991).

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restrictions.



Experiencing Emotion

- The idea that making a happy, sad, or angry face can actually trigger the physiological response and feeling associated with the emotion is called the
 - emotion production theory.
 - emotion control theory.
 - facial-feedback hypothesis.
 - facial expression theory.
- Heightened emotion tends to facilitate rational thinking. (true/false)
- Some research supports the notion that women tend to experience emotions more intensely than men. (true/false)
- Which of the following is *not* one of the central components of love, according to Sternberg's triangular theory?
 - compatibility
 - passion
 - commitment
 - intimacy
- What is the complete form of love, according to Sternberg?
 - romantic love
 - fatuous love
 - companionate love
 - consummate love

Answers: 1. c 2. false 3. true
4. a 5. d

Romantic Love: Lost in Each Other

When we say we have “fallen” in love, it is probably romantic love we have fallen into. Romantic love (sometimes called “passionate love”) is an intense emotional response characterized by a turmoil of emotion, coupled with sexual arousal and a tremendous longing for that person (Hatfield, 1988). Does it mean that love is over when passion fades? Probably not. Love often changes into what has been termed *companionate love* (Hatfield, 1988). This is characterized by a less sexualized sense of affection. As love grows, couples often focus on the stability of the relationship, on the commitment and sense of liking for the other person.

The Six Styles of Love

Canadian psychologist John Allan Lee (1973, 1988) proposed that love is characterized by six different “styles of loving,” all of which may be present in differing degrees for each individual. These dimensions of love are (a) romantic and passionate, (b) friendly, (c) game-playing, (d) possessive, (e) pragmatic, and (f) unselfish.

Sternberg's Theory of Love: Three Components, Seven Types

How does Sternberg's triangular theory of love account for the different kinds of love?

Robert Sternberg (1986b, 1987, 1997), whose triarchic theory of intelligence was discussed earlier, proposes a three-com-

ponent **triangular theory of love**. The three components are intimacy, passion, and commitment. Sternberg (1987) explains intimacy as “those feelings in a relationship that promote closeness, bondedness, and connectedness” (p. 339). Passion refers to those drives in a loving relationship “that lead to romance, physical attraction, [and] sexual consummation” (1986b, p. 119). The decision/commitment component consists of a short-term aspect (i.e., the decision that one person loves another) and a long-term aspect (i.e., the commitment the person makes to maintaining that love over time).

Sternberg proposes that these three components combine in various ways to form different kinds of love. Each component can vary in intensity, from very strong to very weak, and the kind of love that is experienced depends on the strengths of each of the three components relative to one another. *Liking*, for example, has only one of the love components—intimacy. *Infatuated love* consists of strong passion combined with little intimacy and weak decision/commitment, while *romantic love* is a combination of strong passion and great intimacy with weak decision/commitment. **Consummate love** is the only type that

triangular theory of love:

Sternberg's theory that three components—intimacy, passion, and decision/commitment—singly or in various combinations produce seven different kinds of love.

consummate love:

According to Sternberg's theory, the most complete form of love, consisting of three components—intimacy, passion, and decision/commitment.

Apply It!

Imagine this: The thought of even the slightest layer of fat on your body repels you. You have been dieting and exercising strenuously for months, but you still feel fat, even though your friends comment that you're nothing but skin and bones. And you're unbelievably hungry: your dreams and daydreams are all about food—delicious food, lots of it, elegantly served. You leaf through cookbooks, go grocery shopping, and prepare meals whenever you get a chance, but when you sit down to eat you merely play with your food, because if you ate it you might get fat.

Now imagine this: Driven by an uncontrollable urge, you buy a dozen packages of cookies, some pop, perhaps a box of doughnuts. You take them home, lock the door, and start eating them. Once you've started, you can't stop—you gorge yourself on cookies and doughnuts until you feel as if you're about to explode. At that point you are overcome with disgust and anger at yourself; you take a double dose of laxative in an effort to get rid of

the excess volume of food you have consumed.

These two scenarios are not as unusual as you might think. They represent two surprisingly common eating disorders: anorexia nervosa and bulimia nervosa. What causes these disorders, and how can they be treated?

Although there are some similarities between them, anorexia and bulimia are very different disorders. *Anorexia nervosa* is characterized by an overwhelming, irrational fear of gaining weight or becoming fat, compulsive dieting to the point of self-starvation, and excessive weight loss. Some anorexics lose as much as 20 to 25 percent of their original body weight. Anorexia typically begins in adolescence, and 90 percent of those afflicted are females (American Psychiatric Association, 1994). About 1 percent of females between 12 and 40 suffer from this disorder (Johnson et al., 1996).

Anorexia often begins with dieting, perhaps in reaction to a gain in weight after the onset of menstruation. Gradually the dieting develops into an

obsession. Anorexic individuals continue to feel hunger and are strangely preoccupied with food. They spend inordinate amounts of time thinking about food, reading recipes, shopping for food, preparing it, and watching other people eat.

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has all three components in great intensity and is certainly perceived to be the ideal type of love relationship for which many people strive. However, Sternberg cautions that maintaining consummate love may be even harder than achieving it!

Sternberg stresses the importance of translating the components of love into action. “Without expression,” he warns, “even the greatest of loves can die” (1987, p. 341).

Love in all its fullness, its richness, and its power is such an intense and consuming human experience that researchers find it hard to capture. It is almost

too personal to be viewed and studied with passionless objectivity. Love, the strongest emotional bond, is the most satisfying human experience imaginable for those fortunate enough to find it.

LINK IT!

www.ams.queensu.ca/anab

Anorexia Nervosa and Bulimia Association

www.nedic.on.ca

National Eating Disorder Information Centre

Anorexic individuals also have a gross distortion in the perception of their body size. No matter how thin they become, they continue to perceive themselves as fat. They are so obsessed with their weight that frequently they not only starve themselves but also exercise relentlessly and excessively in an effort to accelerate their weight loss.

It is difficult to pinpoint the cause of this disorder. Some investigators believe that young women who refuse to eat are attempting to control a portion of their lives, which they may feel unable to control in other respects.

Most anorexics are steadfast in their refusal to eat; about 20 percent of them starve themselves to death while insisting that nothing is wrong with them (Brotman, 1994).

Up to 50 percent of anorexics also develop symptoms of bulimia nervosa, a chronic disorder characterized by repeated and uncontrolled episodes of binge eating, often in secret (American Psychiatric Association 1993). An episode of binge eating has two main features: (1) much larger amounts of food than most people

would eat during the same period of time, and (2) a feeling of inability to stop the eating or control the amount eaten. Binges are frequently followed by purging: self-induced vomiting and/or the use of large quantities of laxatives and diuretics. Bulimics may also engage in excessive dieting and exercise. Athletes are especially susceptible to this disorder. Many bulimics are average in size, and they purge after an eating binge simply to maintain their weight.

Bulimia nervosa can cause a number of health problems. The stomach acid in vomit eats away at the teeth and may cause them to rot, and the delicate balance of body chemistry is destroyed by excessive use of laxatives and diuretics. The disorder also has a strong emotional component; the bulimic individual is aware that the eating pattern is abnormal and feels unable to control it. Depression, guilt, and shame often accompany the binges and subsequent purging.

Bulimia nervosa tends to appear in the late teenage years and affects about one in 25 women during their lifetime (Kendler et al., 1991). An even

larger number of young women regularly binge and purge, but not frequently enough to warrant the diagnosis of bulimia nervosa (Drewnowski et al., 1994). About 10 to 15 percent of all bulimics are males (Carlat et al., 1997).

Bulimia, like anorexia, is difficult to treat. Cognitive-behavioural therapy has been used successfully to help modify eating habits and abnormal attitudes about body shape and weight (Agras et al., 2000; Halmi, 1996; Johnson et al., 1996). Certain antidepressant drugs result in significant attitudinal change (Agras et al., 1994; "Eating disorders," 1997), but it appears that cognitive-behavioural therapy is more effective (Whittal et al., 1999).

If you or someone you know is showing signs of suffering from either of these disorders, you can get help by contacting the National Eating Disorder Information Centre, College Wing, Rm. 1-211, 200 Elizabeth St., Toronto ON, M5G 2C4, (416) 340-4156. Or contact a local agency through the public health department or your local hospital.

KEY TERMS

- | | | |
|------------------------------------|-----------------------------------|--|
| arousal, p. 292 | homeostasis, p. 292 | primary drive, p. 296 |
| arousal theory, p. 292 | incentive, p. 290 | Schachter-Singer theory, p. 305 |
| basic emotions, p. 306 | instinct, p. 291 | self-actualization, p. 294 |
| Cannon-Bard theory, p. 305 | instinct theory, p. 291 | sensory deprivation, p. 293 |
| consummate love, p. 313 | intrinsic motivation, p. 290 | set point, p. 300 |
| display rules, p. 307 | James-Lange theory, p. 304 | social motives, p. 300 |
| drive, p. 292 | lateral hypothalamus (LH), p. 296 | stimulus motives, p. 293 |
| drive-reduction theory, p. 291 | Lazarus theory, p. 305 | Thematic Apperception Test (TAT), p. 300 |
| emotion, p. 303 | metabolic rate, p. 299 | triangular theory of love, p. 313 |
| extrinsic motivation, p. 290 | motivation, p. 290 | ventromedial hypothalamus (VMH), p. 296 |
| facial-feedback hypothesis, p. 310 | motives, p. 290 | Yerkes-Dodson law, p. 293 |
| fat cells, p. 299 | need for achievement, p. 300 | |
| hierarchy of needs, p. 294 | obesity, p. 299 | |

THINKING CRITICALLY

Evaluation

In your view, which theory or combination of theories best explains motivation: drive-reduction theory, arousal theory, or Maslow's hierarchy of needs? Which theory do you find least convincing? Support your answers.

Using what you have learned about body weight and dieting, select any well-known weight-loss plan (for example, Weight Watchers, Jenny

Craig, Slim-Fast) and evaluate it, explaining why it is or is not an effective way to lose weight and keep it off.

Point/Counterpoint

Present a convincing argument for each of these positions:

- a. Polygraph testing should not be allowed in the legal system or in business and industry.

- b. Polygraph testing should be allowed in the legal system and in business and industry.

Psychology in Your Life

Which level of Maslow's hierarchy (shown in Figure 9.2) provides the strongest motivation for your behaviour in general? Give specific examples to support your answer.

SUMMARY & REVIEW

Introduction to Motivation

What is the difference between intrinsic and extrinsic motivation?

With intrinsic motivation, an act is performed because it is satisfying or pleasurable in and of itself; with extrinsic motivation, an act is performed to bring a reward or to avert an undesirable consequence.

Theories of Motivation

How do instinct theories explain motivation?

Instinct theories suggest that human behaviour is motivated by certain innate, unlearned tendencies, or instincts, that are shared by all individuals.

What is the drive-reduction theory of motivation?

Drive-reduction theory suggests that a biological need creates an unpleasant state of arousal or tension called a *drive*, which impels the organism to engage in behaviour that will satisfy the need and reduce tension.

How does arousal theory explain motivation?

Arousal theory suggests that the aim of motivation is to maintain an optimal level of arousal. If arousal is less than optimal, we engage in activities that stimulate arousal; if arousal exceeds the optimal level, we seek to reduce stimulation.

How does Maslow's hierarchy of needs account for human motivation?

Maslow's hierarchy of needs arranges needs in order of urgency—from physical needs (food, water, air, shelter) to security needs, belonging needs, esteem needs, and finally the need for self-actualization (developing to one's full potential) at the top of the hierarchy. Theoretically, the needs at the lower levels must be satisfied adequately before a person will be motivated to fulfill the higher needs.

The Primary Drives: Hunger and Thirst

Under what kinds of conditions do the two types of thirst occur?

One type of thirst results from a loss of bodily fluid that can be caused by perspiration, vomiting, bleeding, diarrhea, or excessive intake of alcohol. Another type of thirst results from excessive intake of salt, which disturbs the water-sodium balance.

What are the roles of the lateral hypothalamus and the ventromedial hypothalamus in the regulation of eating behaviour?

The lateral hypothalamus (LH) apparently acts as a feeding centre: when activated, it signals the animal to start eating; when it is destroyed, the animal refuses to eat. The ventromedial hypothalamus (VMH) evidently acts as a satiety centre: when activated, it signals the animal to stop eating; when it is destroyed, the animal overeats, becoming obese.

What are some of the body's hunger and satiety signals?

Some biological hunger signals are stomach contractions, low blood glucose levels, and high insulin levels. Some satiety signals are a full or distended stomach, high blood glucose levels, and the presence in the blood of other satiety substances (such as CCK) that are secreted by the gastrointestinal tract during digestion.

What are some non-biological factors that influence what and how much we eat?

External eating cues, such as the taste, smell, and appearance of food, the variety of food offered, and the time of day, can cause people to eat more food than they actually need.

What are some factors that account for variations in body weight?

Variations in body weight are influenced by heredity, metabolic rate, activity level, number of fat cells, and eating habits.

How does set point affect body weight?

Set-point theory suggests that an internal homeostatic system functions to maintain body weight by adjusting appetite and metabolic rate.

Social Motives

What is Murray's contribution to the study of motivation?

Murray defined a list of social motives, or needs, and developed the Thematic Apperception Test (TAT) to assess a person's level of these needs.

What is the need for achievement?

The need for achievement is the need to accomplish something difficult and to perform at a high standard of excellence.

What are some characteristics shared by people who are high in achievement motivation?

People high in achievement motivation enjoy challenges and like to compete. They tend to set goals of moderate difficulty, are more motivated by hope of success than by fear of failure, attribute their success to their ability and hard work, and are most often drawn to business, frequently becoming entrepreneurs.

The What and Why of Emotions

What are the three components of emotions?

An emotion is a feeling state that involves physiological arousal, a cognitive appraisal of the situation arousing the emotion, and outward expression of the emotion.

According to the James-Lange theory, what sequence of events occurs when we experience an emotion?

According to the James-Lange theory of emotion, environmental stimuli produce a physiological response, and then our awareness of this response causes the emotion.

What is the Cannon-Bard theory of emotion?

The Cannon-Bard theory suggests that emotion-provoking stimuli received by the senses are relayed to the thalamus, which simultaneously passes the information to the cortex, giving us the mental experience of the emotion, and to the internal organs, producing physiological arousal.

According to the Schachter-Singer theory, what two things must occur in order for us to experience an emotion?

The Schachter-Singer theory states that for an emotion to occur, (1) there must be physiological arousal, and (2) the person must perceive some reason for the arousal in order to label the emotion.

According to Lazarus, what sequence of events occurs when an individual feels an emotion?

An emotion-provoking stimulus triggers a cognitive appraisal, which is followed by the emotion and the physiological arousal.

The Expression of Emotion

What are basic emotions?

The basic emotions (happiness, sadness, disgust, etc.) are those that are unlearned and that are reflected in the same facial expressions in all cultures.

How does the development of facial expressions of different emotions in infants suggest a biological basis for emotional expression?

The facial expressions of different emotions develop in a particular sequence in infants and seem to be the result of maturation rather than learning. The same sequence occurs even in children who have been blind and deaf since birth.

Why is emotion considered a form of communication?

Emotions enable us to communicate our feelings, intentions, and needs more effectively than just words alone and thus make it more likely that others will respond to us.

Experiencing Emotion

What is the facial-feedback hypothesis?

The facial-feedback hypothesis suggests that the muscular movements involved in certain facial expressions trigger the corresponding emotion (for example, smiling makes us happy).

How does Sternberg's triangular theory of love account for the different kinds of love?

In his triangular theory of love, Sternberg proposes that three components—intimacy, passion, and decision/commitment—singly or in various combinations produce seven different kinds of love—infatuated, empty, romantic, fatuous, companionate, and consummate love, as well as liking.

