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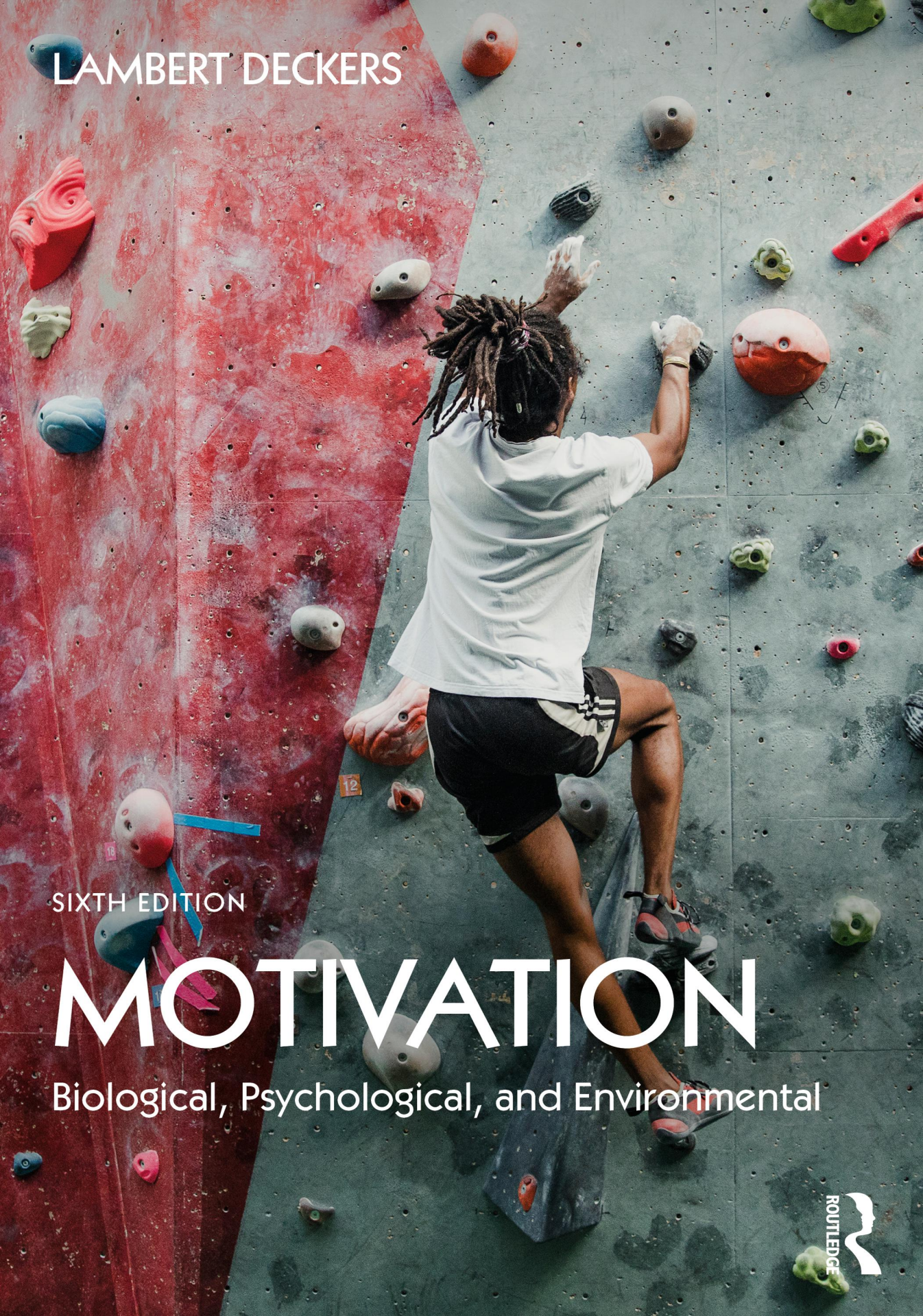

SIXTH EDITION

MOTIVATION

Biological, Psychological, and Environmental

ROUTLEDGE

Motivation

Motivation provides an accessible introduction to motivation and emotion, combining classic studies with current research and uses numerous real-world examples to engage the student and make, often difficult, theoretical concepts come to life. By understanding and applying the principles of motivation described in the text, students will not only discover insights into what motivates their own behavior but also how to instigate self-change through goal-setting.

Throughout the book, the author adopts an evolutionary approach to explore the effect of interpersonal relationships, food preferences, fear, music, and the emotions on motivation, at the same time considering how personality traits and psychological needs are essential for understanding why people are motivated by different things. The motivation of compulsive behavior from addictions, such as drugs, gambling, Internet gaming, and obsessive exercise is also considered, providing a truly comprehensive overview of biological, psychological, and environmental sources of motivation.

The sixth edition has been thoroughly updated throughout and is accompanied by an instructor's manual that contains multiple choice questions, essay questions with answers, websites related to motivation and emotion, power point slides, in-class activities, and discussion questions. It is an essential read for all students of motivation.

Lambert Deckers is professor emeritus of psychological science at Ball State University in Muncie, Indiana. He taught psychology courses for 45 years, with 40 years devoted to teaching a course in motivation and emotion. He also taught courses in the psychology of learning, and history and systems of psychology. Professor Deckers is a charter member of the Association for Psychological Science and a member of the Society for the Science of Motivation.

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Motivation

Biological, Psychological, and Environmental

Sixth Edition

Lambert Deckers

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Dedication

To those individuals whose books, chapters, and articles I read and cited.

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Preface

TO INSTRUCTORS

In this text, motivation means "to be moved into action" or, for a more cognitive orientation, to be moved into cognition, feeling, and action. If motivation refers to inducement of action, feelings, and thought, then what is the source of this inducement? As conveyed by the title, this book provides answers by describing biological, psychological, and environmental sources of motivation. Biological refers to the material aspects of the body, nervous system, and brain. Psychological refers to drives, psychological needs, and personality traits. Environmental sources are composed of incentives and goals. The anticipation of their occurrence motivates behavior. These domains of motivation guided the selection of the eclectic topics that are covered in this text. There are a vast number of topics that could be included in the study of motivation. After all, the task of psychology is to describe behavior and cognition and the circumstances in which they occur. The study of motivation in its many guises attempts to describe and explain how this happens.

SIXTH EDITION

The sixth edition continues with the same eclectic approach as the five prior editions but with many changes and updates. There are many new references that describe new topics, findings, and theories about motivation and emotion. Older topics that are no longer current have been deleted to provide space for this newer material. In addition, each chapter contains its own glossary. This edition also contains web addresses, which have been checked for accuracy and accessibility, where students can find additional information about a topic.

TO STUDENTS

Motivation refers to the "why" of behavior, not the "how." Why do we engage in certain behaviors and have certain feelings and thoughts, but not others? Do some events motivate us while other events do not? I hope that reading this book will provide answers and contribute

to your self-discovery. It may help you understand what motivates some of your behaviors and not others and what motivates some individuals but not others. By applying the principles of motivation, a person can institute self-change. Are there ways you wish to behave, or do you act in ways that you wish you didn't? In the process of change, do people change the environment or alter something about themselves in order to make these changes happen? Perhaps you will find insights and answers in the following pages.

Acknowledgments

I would like to acknowledge that trying to understand the "why" of behavior is probably one of the most fascinating endeavors that a person can pursue. Thanks to Ball State University, it has been possible for me to do this. I would like to thank all former students in my motivation and emotion course who read the book and provided feedback. An appreciation also goes to my former colleagues Thomas Holtgraves and David Perkins. An expression of gratitude goes to my wife, Cindy Ruman, for her expertise and help.

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CHAPTER 1

Introduction to Motivation and Emotion

"There's no free will," says the philosopher; "to hang is most unjust." "There is no free will," assents the officer; "we hang because we must."

—Ambrose Bierce, 1911

Either our actions are determined, in which case we are not responsible for them, or they are the results of random events, in which case we are not responsible for them.

—Hume's Fork
David Hume, 1711–1776

To prepare the groundwork for motivation and emotion, consider these questions:

1. What is the definition of motivation?
2. What are the differences among motives, incentives, and goals?
3. Does motivation consist of anticipating future events, future behaviors, and future feelings?
4. How is motivation reflected in thinking and behaving?
5. What is emotion? How does it motivate behavior?

MEANING OF MOTIVATION

Why did the chicken cross the road? This is a question about motivation. There are many possibilities. First, the chicken was simply motivated to achieve the goal of reaching the other side. Or the chicken was motivated to avoid remaining on the current side because of the approaching chef. The motivation may also have resided within the chicken. Maybe she was motivated to satisfy a psychological need, such as the need for closure. She needed a definite answer of what was on the other side. Another is the need for competence. I, a mere chicken, am as competent and capable as anyone in crossing the road. Perhaps the answer lies in the chicken's various personality traits. A chicken high in the trait of openness-to-experience, like her, would eagerly embrace the experience of being on the other side. Finally, the chicken may have been experiencing various emotions. She was afraid and the other side provided safety. Or the current side was disgusting and the other side was not. Also, the chickens on the other side appeared happier; so why not join them? And finally, maybe she was in love with the majestic rooster on the other side of the road?

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These questions about what motivated the chicken serve as an introduction to the complexities of human motivation. The chicken's motivation and behavior were simple. In contrast, human behavior is vastly more complex, as are the sources of motivation. Reaching the other side of the road is like *end-states* in human motivation. End-states resemble the aim or purpose of motivation like attaining incentives, achieving goals, or satisfying needs. Where does the motivation to reach these end-states reside? Does it reside outside the person in the environment or does it reside within the person as needs, traits, or motives? Read further to find the answers.

To Be Moved into Action

Consider the implication for motivation of the following statements:

Hunger drives a person to raid the refrigerator for food.
Math anxiety made her reluctant to enroll in the statistics course.
The residence hall students enjoyed playing volleyball Sunday afternoon.
If you pay your credit card bill on time, then you will avoid an interest charge.
Students attend classes at the university in order to earn a bachelor's degree.

The individuals in these examples, who ate, avoided enrolling, played volleyball, paid their bills when due, and attended classes were motivated to do so. Individuals who did not were not motivated to do so or were motivated to do something else. According to the philosopher Arthur Schopenhauer (1841/1960), to be **motivated** is to be moved into action, or a change in action. It comes from being pushed by the past and pulled by the future. The past resides in our internal motives and the future exists in anticipated external goals and incentives. The past and future define three categories of motivation: motive, goal, and incentive. A **motive** is a person's relatively stable internal disposition to be concerned with and approach positive situations and avoid negative situations (Atkinson, 1958/1983). For example, people have a stable disposition or motive to eat over their life time. Sometimes the motive to eat can be strong, which occurs when a person is hungry. Emotions also serve as motives like anxiety motivating avoidance behavior. A **goal** is represented as the internal image of a future outcome; an end-state. It motivates and guides the behavior necessary for achievement. For instance, students imagine their goal of graduating from a university. This image motivates and guides the academic behavior necessary to achieve that goal. People's goals often stem from their motives. The goal of a motive is the satisfaction of that motive (Atkinson, 1958/1983). For instance, hunger motivates eating because that achieves the goal of satisfying hunger. Similarly, gaining friends is the goal of the need to affiliate because friends satisfy that need. An **incentive** is an anticipated reward or aversive event available in the environment. Positive incentives attract us, while negative incentives do the opposite; they deter us. An incentive is also contingent on behavior, which means a person must perform the prescribed behavior in order to attain or avoid it. Goals and incentives are connected. While goals are the focus of motivation, incentives can contribute to that motivation. Incentives do so by making a goal seem more attractive or valuable. For instance, grades, parental approval, and feelings of self-esteem are positive incentives that help motivate (incentivize) a student to work toward the goal of graduation. A late charge is a negative incentive that helps motivate the goal of prompt bill paying. Sometimes, however, the

distinction between motives and incentives or goals is not clear. For example, in a murder mystery, detectives may ask "What was the perpetrator's motive?" when they meant to say "What was the goal of the crime?" In life, the motivation of behavior is a function of all three: motives, goals, and incentives.

Push and Pull

Is motivation the result of being pushed, pulled, and their combination? The chicken's motive, such as fear of the approaching chef pushed her to the other side of the road while other chickens or the rooster already there, pulled her over. Likewise, human motives (desire, emotion, longing, need) push individuals toward some end-state while external events, referred to as incentives and goals, pull individuals there. Figure 1.1 illustrates this push/pull view of motivation. A person's internal disposition specifies the nature of this end-state or goal. Internal dispositions may consist of biological motives like hunger, psychological motives like the need to belong, or a value system that confers worth on an incentive or goal. Figure 1.1 illustrates that hunger pushes a person toward a goal of eating food and a psychological need to belong pushes a person toward a goal of being with good friends or family members. In addition, a person's values determine the pulling power of a particular incentive or goal, such as the value placed on a university degree. From the combination of push and pull, individuals are motivated toward the appropriate end where motives and goals become linked together. There, for example, eating satisfies hunger, relating to others fulfills the need to belong, and completing university requirements achieves the valued goal of graduation.

Emotions as Motives

How do you feel when insulted/dissed, when faced with an exam, or when your best friend moved away? Many individuals will feel anger, anxiety, and sadness, accordingly. These subjective feelings are known as **affect**. It is part of the array of reactions that make up emotions. These reactions include physiological arousal, a readiness to act, and facial expressions. They operate in synchrony because they are motivated to meet the aim of the emotion. For example, for anger, the aim is to redress a wrong, for anxiety to attain a secure feeling, and

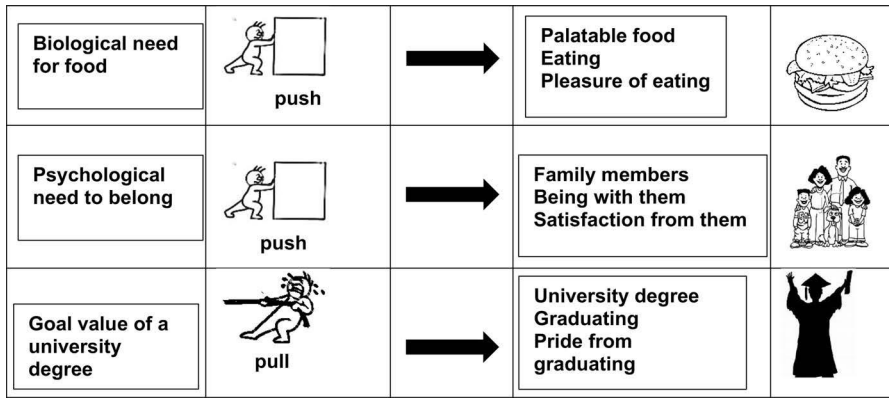

FIGURE 1.1 Push/Pull Motivation. Motives like biological needs and psychological needs act like push motivation while external incentives and goals act like pull motivation. The actions of push/pull bring individuals to the desired end-states.

for sadness to seek comfort from others. During an **emotion**, the various reactions act in unison because that way they most effectively cope with a challenging environmental event. This unity enhances an individual's well-being, as well as their chances of survival (Keltner & Shiota, 2003). Challenges like insults, being tested, or a personal loss have occurred many times in human history and emotions have evolved to cope with them effectively. In short, emotions motivate behavior in order to achieve the aim of the emotion.

Purpose of a Motivation Psychology

Does motivation apply the same way to everyone? Are there grand theories of motivation that would apply equally to everyone, such as the law of gravity? For example, imagine a tall, heavy person and a short, light person jumping simultaneously off the high platform into the swimming pool. Regardless of their difference in height and weight, both will hit the water simultaneously. A simple explanation is based on the law of gravity; it applies equally to all objects, regardless of their size or weight. Unfortunately for psychology, things are not so simple. What motivates a person at one time may not do so at another time. And what motivates one person may not motivate another.

For example, food motivates people to eat when they are hungry but less so when not hungry. Furthermore, the motivation for eating may be greater for heavier people, since they require more calories compared to lighter people. To illustrate, Figure 1.2a shows that, at a party, you might eat ten potato chips when hungry but only five when you are not (Sadoul et al., 2014). Furthermore, at that party one person may eat more than another, even if they are equally hungry. For example, people may differ in their level of extraversion. This characteristic about a person's sociability ranges from introversion (quiet, withdrawn) to extraversion (bold, talkative). Figure 1.2b shows, for instance, an extraverted individual being sociable and talkative might eat ten chips compared to five by a less sociable or introverted individual (Keller &

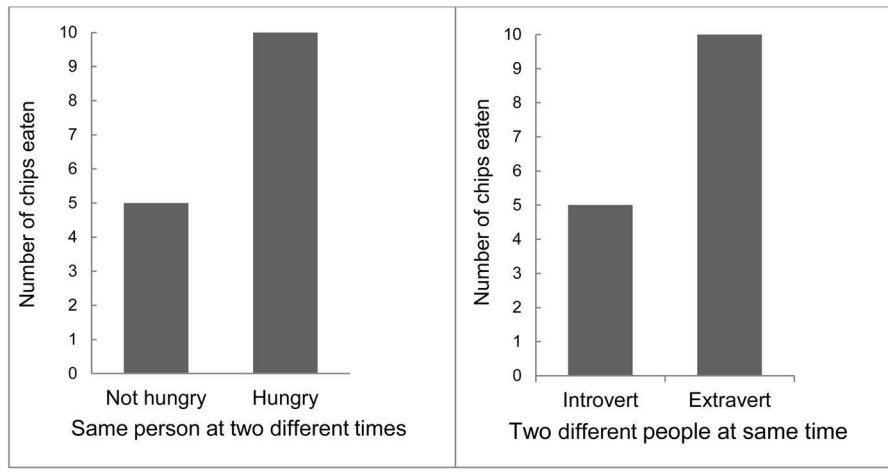

FIGURE 1.2a Eating Varies within Individuals. An individual eats more when hungry compared to when not hungry. **b. Eating Varies among Individuals.** One individual eats more than another; an extravert eats more at a party than an introvert does.

Siegrist, 2015). But if different people are motivated differently at different times, then how is it possible to develop a psychology of motivation? The answer is that psychologists attempt to show how motivation varies *within* a person at different times or *among* different people at the same time. Thus, one research strategy is to show how motivated behavior changes with temporary changes in a person's internal motives, such as hungry versus not hungry (Figure 1.2a). A second research strategy is to show how motivated behavior varies among different individuals, such as introverts versus extraverts (Figure 1.2b).

Motivation as Anticipation of the Future

Do you look ahead when you walk? Do you look ahead in time—that is, to the future? These two questions suggest the idea that motivation is a journey that takes you to an end-state of your choosing. This journey idea implies that individuals are capable of looking ahead and visualizing their future. In fact, philosophers and early psychologists have long been aware that humans are motivated by the anticipated outcomes of their actions. Over 200 years ago, in the first general psychology book (Hatfield, 1998), *Anthropology from a Pragmatic Point of View*, Immanuel Kant (1797/1978) describes the faculty of foreseeing: "Among all the prospects which man can have, the most comforting is, on the basis of his present moral condition, to look forward to something permanent and to further progress toward a still better prospect" (p. 78). A person may never have experienced the event before, but may have thought about various aspects of it. So, can you foresee eating your next meal, finishing reading this chapter, or graduating?

What lies in these chosen end-states that motivate individuals? As Figure 1.1 illustrates, end-states may consist of things, behaviors, or feelings. For example, the end-state can be a thing like food, a behavior like eating food, or a feeling like the pleasure derived from eating food. However, an intermediate step has been left out. An individual is motivated not by the actual end-state but by the expectation and anticipation of it. People go to a restaurant expecting food to be there, visit family and friends expecting their need to belong will be satisfied, and attend universities expecting to earn a degree. If the end-states in Figure 1.1 are not expected, then the behaviors will not occur. Motivation depends on some entity residing in the end-states. Thus, why enter a restaurant, visit friends, or enroll in a university if food, friends, and a degree are not expected? Motivation can also depend on visualizing the end-state as consisting of **consummatory** (to consummate = to finish) **behavior**, which signals the end of the motivational sequence. The consummatory behaviors in Figure 1.1 are eating, associating or being with others, or graduating. Finally, the end-state could consist of the subjective feelings that are part of consummatory behavior, such as the pleasure of eating, the happiness from relating to others, and the pride felt on graduation. Sometimes, however, the expectation or anticipation of the end-state receives little attention or occurs without awareness. Habits are examples of behaviors that occur with little conscious awareness of their end-states. Psychologists have used various types of analyses to account for motivation in terms of expecting an end-state or goal. Cognitive analyses, behavioral anticipation, and affective devices are broad views of how to understand motivation.

Cognitive Motivation

The pizza restaurant in Figure 1.3 illustrates the function of expectation or anticipation in pull motivation. One pull mechanism is **cognitive motivation**, which works by visualizing

an end-state as a goal and executing a plan or following a script to achieve that goal (Miller et al., 1960; Schank & Abelson, 1977). This visualization is easiest to perform for concrete aspects of the goal and accompanying consummatory behavior (Shepard, 1978). For example, it is easy to form a mental picture of the concrete goal in Figure 1.3: a restaurant, a pizza, and eating. To reach the goal, however, requires a plan of action or series of behaviors to achieve it. These can be visualized also. The plan involves a hierarchy of steps or a sequence of specific behaviors that when performed bring individuals closer and closer to their goal. For example, if a student's goal is to reach the restaurant, then the first stage is to locate it on her cognitive map. The next stage is to select a route and then to walk or drive to the restaurant until she arrives, orders, and eats.

Anticipatory Behavior and Simulation

Behavioral anticipation is a second mechanism by which pull motivation occurs. Over half a century ago, neo-behaviorists formulated an **anticipatory response mechanism** to account for goal motivation (Lachman, 1960; Spence, 1956). According to this mechanism, the goal evokes excitement in the form of miniscule consummatory behaviors that would occur to the actual goal. For example, the goal in Figure 1.3 consists of eating pizza, which is referred to as consummatory behavior because it consummated (finished) the motivation sequence that began with hunger, the thought of food, and choosing the restaurant. The anticipatory response mechanism consists of imaginary responses that resemble actually eating pizza: handling pizza, chewing, and salivating. These responses occur involuntarily to events that predict or are associated with eating pizza, such as dinner time, rumbling of stomach, someone saying "pizza," pizza advertisement, and the location of the restaurant. An individual is aware of this anticipation, which serves as a stimulus that pulls the individual toward the restaurant. Furthermore, anticipation becomes more intense the closer a person gets to actually eating the pizza. In this sense, the anticipatory response mechanism becomes a case of pull motivation, since the stimuli associated with the goal pull individuals along to the pizza restaurant.

Motivation toward a specific end-state also occurs by way of simulation; an elaboration of the anticipatory response mechanism. **Simulation** refers to an array of anticipated psychological experiences that occur as if the individual were actually experiencing the end-state.

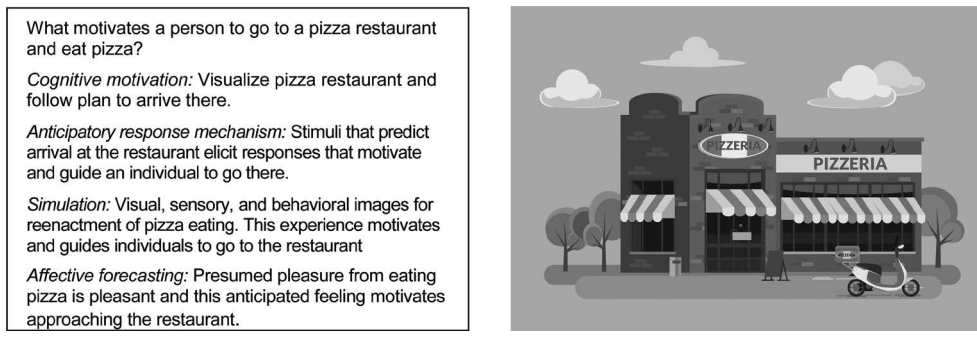

FIGURE 1.3 Motivation as Anticipation. Motivation for pizza involves anticipating the following: (1) visualizing a pizza, which is the goal object; (2) visualizing eating pizza, which is the consummatory behavior; and (3) visualizing the pleasure of eating the pizza, which is the subjective feeling.

These experiences could consist of visualizing the end-state, mentally interacting with it, or imagining what it would feel like (Barsalou, 2008, 2009). In addition, different aspects of simulation are linked to different brain regions. Thus, in anticipating the various features of the end-state, their corresponding brain areas become active. For example, in the case of food, one set of interconnected areas respond to the sensory and hedonic qualities of food while other brain areas are involved in the expected perception and interaction with food (Barrós-Loscertales et al., 2012; Simmons et al., 2005). In the case of simulating the goal of eating pizza, several motivational features are present (see Figure 1.3). First, there is the imagined perception of what the pizza looks like upon arrival at the table. Second, there is the simulated sensory experience of smelling and eating pizza. In addition, part of the simulated environment includes the location and social setting. All of these psychological experiences emerge from brain regions that give rise to these visions, sensations, pleasures, and behaviors. Thus, simulation is the psychological re-enactment of an actual eating-pizza experience that motivates the individual toward the restaurant.

Affective Forecasting

Anticipating how we will feel, our affect, is the fourth motivational mechanism. **Affective forecasting** resembles a weather report but concerns the individual's expected subjective feelings of pain and pleasure in the future. These feelings arise from achieving a goal and from the accompanying consummatory behavior, such as the pleasure of eating pizza when hungry. Thus, affective forecasting is an important determiner of motivation, since people's choices and future behaviors are based on their anticipated feelings. Troland (1928/1967), for instance, claimed the present anticipation of future pleasure is pleasant and the present anticipation of future pain is unpleasant. Thus, anticipating a positive goal is associated with pleasant feelings, while expecting a negative outcome is associated with unpleasant feelings. People are usually accurate in forecasting whether their feelings will be unpleasant or pleasant. However, they are more likely to err in predicting the intensity and duration of those feelings (Wilson & Gilbert, 2005).

How does affective forecasting work to motivate behavior? And what are the implications of any errors that might occur in affective forecasting? For instance, try to forecast your level of positive affect during a 15-minute walk on campus. This walk could either be indoors by way of buildings and tunnels or outdoors on a path between a road and a river at the edge of campus. Before starting out, forecast your positive affect by rating, for example, how active, excited, and interested you would be on the indoor walk or on the outdoor walk. Then after completing the walk rate your positive affect again. Participants in such an exercise made forecasting errors. They overestimated their positive affect for the indoor walk and underestimated their positive affect for the outdoor walk. In other words, the indoor walk was less enjoyable than expected and the outdoor walk would have been more enjoyable (Nisbet & Zelenski, 2011). One implication is reduced happiness that results when an individual chooses an indoor path rather than an outdoor one. In another example, imagine being an introverted, reserved, quiet individual, who is asked to act like an extravert by being bold, talkative, and assertive. Forecast what your positive affect (excited, interested) and your negative affect (worried, nervous) would be prior to acting in this manner. Then rate yourself afterwards. Results of such research indicate that introverted individuals when required to act extraverted underestimated their positive affect and overestimated their

negative affect (Zelenski et al., 2013). As a result of these affect prediction errors, introverted individuals may tend to avoid social settings where extraverted behavior is required. But, in doing so, they miss opportunities for a good time.

Hedonism

Affective forecasting deals with how behavior will feel to an individual. Will the behavior feel unpleasant or pleasant? These questions about positive and negative feelings come under a motivation principle known as **hedonism**. According to ancient Greek philosophers, hedonism refers to the pursuit of pleasure and the avoidance of pain. Among the first ancient promoters of hedonism was the Greek philosopher Socrates (470–399 B.C.), who claimed a person should follow a course of action for which pleasure exceeds pain. Another philosopher, Democritus (460–370 B.C.), claimed that it was both natural and good for people to follow this course of action. However, do not think that you can spend your tuition money on the vacation of your dreams, that you can party every night, or charge on your credit card the best smartphone available. These actions have additional consequences. For philosophers, hedonism meant striving for the greater good or the long-term good. This view was expressed over a century later by another Greek philosopher, Epicurus (341–271 B.C.). He maintained that individuals should sometimes forego pleasures when their consequences involved a greater amount of discomfort (Long & Sedley, 1987). Later philosophers like Jeremy Bentham (1789/1970) brought the concept of hedonism to the forefront by claiming that humans are under the governance of two masters: pain and pleasure. These two masters determine our actions—that is, what motivates us.

If hedonism works best when pleasure and pain are averaged out in the long-run, then a person might forgo certain intense pleasures if subsequent pain of greater magnitude results. For instance, an individual might drink alcohol in moderation, thereby avoiding the painful aftereffects of overindulgence. Similarly, moderation may require experiencing pain prior to pleasure. An individual may endure immediate pain because more enduring pleasure may be a consequence. A student might forgo the immediate benefit of earning money at an unskilled job, and instead spend her time earning a university degree, which provides more meaningful and fruitful employment later. Or a student may forgo a party Thursday night in order to study for Friday's exam on the assumption that good exam performance will produce greater pleasure than a good party. The party, although providing immediate pleasure, may result in a hangover and poor exam performance the next day, thus compromising long-term gain.

Aspects of Motivation as a Journey

If motivation is like a journey from a current position to a selected end-state, then what end-state is chosen? One critical aspect of an end-state is its temporal (time) distance—that is, how far in the future it is. Also, how does an individual arrive at an end-state—that is, what characterizes motivated behavior?

Fading Influence of Future

Notice that cognitive motivation, simulation, and affective forecasting all concern future events. The future can be near or far. How distant the future end-state is from the present has a tremendous impact on motivation. Future incentives and goals become more motivating as they draw nearer. However, they are less motivating when they are further into the future. For instance, when will you socialize via your smartphone: within the day or within the hour?

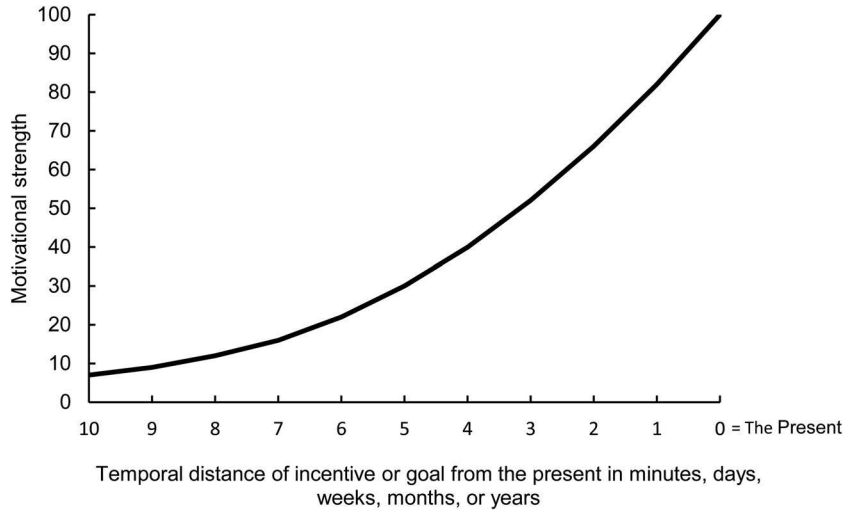

FIGURE 1.4 Temporal Influence of Motivation. The power of an event to motivate behavior decreases the further into the future the outcome or end-state occurs. As the end-state draws closer, its motivational strength increases. Near events are more motivating while far events are less so.

When will you study for the test: in a week, in three days, or the night before? Individuals tend to engage in an activity based on how soon its benefits are realized. For example, when does a student benefit from texting a friend versus studying for an exam? Figure 1.4 shows that as events become progressively closer their motivation increases. Consequently, earlier events are more motivating than later events. For example, because it is temporally closer, socializing via your smartphone is more motivating than studying for tomorrow's test because socializing is available now while the exam is tomorrow. The temporal location of rewards also determines a person's choice, such that closer rewards have the edge in being selected. Thus, individuals often choose a more immediate small reward instead of a larger delayed reward. For example, do you acquire an item now by charging it or acquire it later when you have enough money? An individual may choose to charge the item simply because it is available sooner, even if it means a credit card interest payment. The interest payment increases the cost of the item compared to saving until there is enough money to pay for it.

Indicators of Motivated Behavior

What does motivated behavior look like? The answer lies in Table 1.1. Choice, the first consideration, refers to selecting the motive or outcome from those vying for satisfaction. The choice becomes the goal. A senior in high school has several choices to make, including whether to enter the armed forces, seek employment, or attend a vocational college, or a university. Which option is chosen depends on the intensity of the motive, the attractiveness of the incentive and goal, the likelihood of success, and the effort required. However, choice is only the first step. Next, individuals must be motivated to do what is required to achieve their chosen goal. **Instrumental behaviors** are those motivated activities in which a person engages to satisfy a motive, attain an incentive, or achieve a goal. Working for money, studying to pass a test, and acting kindly toward people are all

TABLE 1.1 Major Indicators of Motivated Behavior

Behavior	Definition and Example
Choice	What an individual actually chooses or selects from among possible alternatives. **Example**: A student chooses to major in psychology rather than some other discipline.
Activation	An individual is spurred or induced into action from a previously inactive state or a change in action or behavior. **Example**: A seated individual gets up and walks to class but then runs in order not to be tardy.
Frequency	This refers to how often (rate) a specific behavior occurs during a fixed time interval. **Example**: Some individuals might check their email accounts 5 times per hour.
Intensity	This refers to the effort, exertion, force, or vigor with which motivated behavior or thought is performed. **Example**: When the door did not open when pulled, he thought hard, then pushed on it with great force.
Persistence	Also known as perseverance, it is revealed by the duration of motivated behavior. **Example**: After 10 job interviews in 6 months without success, the applicant was finally hired after the 11th interview during the 7th month.

examples of instrumental or motivated behavior. Working, studying, and acting kindly are instrumental in earning money, passing exams, and being liked. Often, an individual can choose from among several different ways of satisfying a motive. For instance, in the process of finding a job a person may choose from among reading want ads, visiting an employment agency, accessing online job sites, attending job fairs, or consulting the university career services office.

Instrumental behaviors that reflect motivation include activation, frequency, intensity, and persistence (see Table 1.1). Activation may be the most basic aspect of motivation, since it indicates being spurred into some kind of action or a change in action. For example, a person proceeds from doing nothing to doing something, such as from sitting to walking and then to running. Frequency refers to the rate of a particular behavior, such as class attendance, going to the gym, or sending text messages. For example, what percent of your classes do you attend? How many days per week do you exercise? And how many text messages do you send per day? Intensity or effort of behavior varies directly with motivation. For example, a person's depth of concentration may make him impervious to incoming text messages. Intensity may also imply yelling rather than talking and running rather than walking across the street. Persistence or duration refers to the amount of time a person persists in order to satisfy a motive or achieve a goal. For example, how many years is a person willing to spend preparing for a chosen career or how many hours for typing a course paper?

Section Recap

This section described a broad view of motivation. To be *motivated* means to be induced or moved into action or thought toward some end-state by either the push of a motive or the pull of an incentive or goal. A *motive* is an internal disposition that pushes an individual toward a desired end-state where the motive is satisfied. A *goal* is the cognitive representation of a desired outcome that an individual commits to and attempts to achieve. The goal guides the behavior that results in achieving it. An *incentive* is an anticipated feature of the

environment that pulls an individual toward or away from it. Incentives enhances motivation for goal achievement. *Emotions* act like motives. They motivate the coordination of affect, physiology, and behavior so that they operate in unison in order to adapt to significant environmental changes. The purpose of the psychology of motivation is to explain what motivates the same person at different times and different people at the same time.

Motivation is based on anticipation of the future. It is represented by a journey, which means that an individual tries to reach or achieve various features of an end-state, like a material goal, consummatory behavior, or subjective feelings. *Consummatory behavior* refers to the completion of a motivational sequence as in eating consummates the progression of planning and preparing a meal. End-states are anticipated by either being visualized cognitively as objects, experienced as anticipatory behaviors, or felt as affect. *Cognitive motivation* involves visualizing an end-state or goal as concrete objects, such as food or people. The *anticipatory response mechanism* is an imaginary consummatory response that serves as a sign of an individual's expectations about the interaction with the goal object. *Simulation* refers to anticipating the end-state as if an individual were actually experiencing, visualizing, or imagining it. *Affective forecasting* refers to predicting positive or negative future feelings that occur in expectation of goal achievement. These predicted feelings promote behavior toward or away from the goal. Forecasted feelings are based on the ancient Greek idea of *hedonism*, which refers to the pursuit of pleasure and the avoidance of pain as averaged over the long run. The motivational power of incentives and goals increases as they draw temporally (time) closer. Motivation can also be represented as a behavioral journey that begins with the *choice* of a motive to be satisfied or goal to be achieved. Once a choice is made, a person is motivated to engage in *instrumental behavior* that will eventually satisfy the motive or achieve the goal. Behaviors that indicate motivation are the choices people make plus the activation, frequency, intensity, and persistence of instrumental behavior.

SOURCES OF MOTIVATION

Motivation refers to the sequence of events that starts with motives or anticipated incentives and goals and finishes at end-states. Here motives are satisfied, incentives are attained, and goals are achieved. In order to understand how motivation works, scientists sometimes concentrate on a person's internal dispositions (motives) and sometimes on external events. In Figure 1.1, internal dispositions are hunger, the need to belong, and the value system about a university degree. The external events are palatable food, friends and family, and a university degree. Internal dispositions that push are classified as biological or as psychological, while external sources that pull the person are labeled environmental—that is, as incentives and goals. These sources compose the title of this book. What are the biological and psychological sources that make up the internal sources of motivation? What are the sources of external motivation like incentives and goals? And, why do individuals value certain incentives and goals over others?

Internal Sources

The body and brain are internal physical sources of motivation while the mind is an internal mental source. The body and brain are biological in nature while the mind is psychological.

Sometimes, psychologists dwell on the biological to understand motivation, while other times on the psychological.

Body/Brain as a Source

Hunger is a good example of how both the body and brain determine motivation. Hunger in Figure 1.1, when considered as a biological characteristic, correlates with a particular state of the human body, such as little food in the stomach, a rapid decline in blood glucose, and the circulation of various hormones. For instance, as the hours elapse since lunch, hunger increases as does the hormone ghrelin circulating in the blood stream. Ghrelin is an example of a specific biological entity that is released in the stomach and promotes hunger and eating. In fact, increases in hunger ratings from fasting closely parallel increases in ghrelin as it travels in the bloodstream. Ghrelin is high before meals, and decreases after eating (Cummings et al., 2004). In one experiment, Wren and co-researchers (2001) injected ghrelin into the bloodstream of one group of participants and saline (placebo) into another group. To determine the effects of ghrelin, participants rated their hunger and then were provided a buffet lunch. The results indicated that participants given ghrelin reported greater hunger and ate more than participants given saline. In addition, prior to their lunch, ghrelin participants also indicated that they would eat more. The idea here is that the biological entity ghrelin motivates eating.

Mind as a Source

Motivation can be attributed to the mind and psychological processes while ignoring the body and brain. In this case, the motivation process is considered psychological with little regard for any biological underpinnings. Internal psychological sources of motivation were traditionally divided into two varieties: drives and psychological needs. **Drive**, on the one hand, was created by depriving an animal of some necessary substance, such as water, food, or environmental stimulation. These deprivations resulted in thirst drive, hunger drive, and a curiosity drive, respectively. Longer periods of deprivation defined stronger drives. For example, 12 hours of food deprivation results in a stronger hunger drive than does 8 hours of deprivation. **Psychological needs**, on the other hand, are assumed to already exist at different intensities in individuals. Psychological questionnaires or scales are used to indicate the intensity of psychological needs, much like stepping on a bathroom scale indicates a person's weight. With such an approach, Henry Murray (1938) used his *Psychological Insights Test* to measure the intensity of various psychological needs. For instance, he defined the need to affiliate as approaching others with affection and remaining loyal to them. To measure the intensity of this need, rate yourself from *–3 (below average) to +3 (above average)* on the extent the following statement is true of you: "I am in my element when I am with a group of people who enjoy life." Murray postulated the existence of some 22 psychological needs with each requiring a different set of questions to measure their intensity. The scores indicate the intensity of the psychological need; higher scores indicate greater need intensity.

How and why do drives and psychological needs motivate behavior? First, humans are motivated to reduce drive, since drives were characterized as being painful or unpleasant (Hull, 1943, 1952). Therefore, based on hedonism, any behavior that reduces drive will be more likely to occur. Drinking reduces an unpleasant thirst drive, eating reduces an unpleasant hunger drive, and visual stimulation satisfies a curiosity drive. Thus, drive motivates behavior in order to reduce the intensity of any unpleasant feelings associated with it. Second, as drive

increases, motivation increases also. For instance, longer hours of water deprivation increase the degree of thirst drive and hence its unpleasantness. A stronger thirst drive, in turn, leads to stronger motivation for a water incentive. And indeed, rats, for instance, will run faster for a water reward when their thirst drives are stronger (Hillman et al., 1953). Psychological needs motivate behavior in a similar manner. Psychological needs are unpleasant and their satisfaction reduces their unpleasantness. To illustrate, a person's need to belong motivates her to seek out individuals to connect with (see Figure 1.1). For instance, students with a strong need to belong might experience greater homesickness during their first week on campus. Consequently, they are motivated to make more phone calls home (Watt & Badger, 2009).

External Sources

Whether a person approaches or avoids an outcome depends on its **valence**. It refers to the positive or negative quality of a possible outcome, such as an incentive or goal. Positive valence means the outcome is pleasant and satisfying, while negative valence means the outcome is unpleasant or dissatisfying. Positive events attract people while negative events repel them. So, how do the following events motivate you?

Do you try to attain or avoid a speeding ticket?
Do you try to achieve or avoid an *A* grade on an exam?
Do you try to gain or avoid an interest payment on credit card debt?
Do you try to gain or avoid part-time employment at $15 per hour?
Do you try to attain or avoid your romantic partner breaking up with you?
Do you try to achieve or avoid graduation from your university?

For example, a speeding ticket, an interest payment, and breaking up have a negative valence, while an *A* grade, $15 per hour, and graduation have a positive valence. As a general rule, negative outcomes produce pain or unhappiness while positive outcomes produce pleasure and happiness. These examples provide insight into a field that has become known as **incentive motivation**. Its roots are in the writing of Thomas Hobbes in 1640. For him, incentives are anticipated events that are approached if pleasurable and avoided if painful, almost as if positive incentives attract or pull us while unattractive ones repel us. On the one hand, a person is motivated to avoid a speeding ticket, an interest payment, and a romantic break-up. On the other hand, a person is motivated to approach/attain/achieve an *A* grade, $15/hour part-time employment, and graduation. Thus, events with a positive valence foster approach motivation, while those with a negative valence foster avoidance motivation.

In addition to having a negative or positive valence, incentives have two other properties: utility and value. For example, a university degree has both utility and value. Utility means how useful is a degree, such as for income potential, interesting employment, and feelings of self-worth. Its historical roots go back to the philosopher Jeremy Bentham (1789/1970), who used the phrase **principle of utility** to describe the idea that our actions are determined by whether they decrease or increase our happiness. An incentive has utility if it is useful, benefits us, induces pleasure, or happiness, but it also has utility if it prevents pain or reduces unhappiness. Money, smartphones, computers, and a university degree have utility because they provide the means to increase our happiness. In addition, utility has value—that is,

some goals and incentives are more useful than others or have greater utility than others. For instance, $100 has more utility than $50 because more can be purchased with $100. But $100 also has greater value than $50, since $100 is obviously more than $50. In the case of a university degree, its value is based on its importance for the individual in the moment. When energetic and in the midst of studying a student might value the degree highly, but when ill or very sleepy its value may not be high at that moment. Psychological views of motivation differ in their use of the term value versus utility. Some views emphasize the value of an incentive or goal for the motivation of behavior, while other views emphasize utility.

Utility and value motivate student academic behavior. For example, what is the utility and value of this course for your personal, academic, and professional life? Can you list ways that it is useful and valuable for you? Using a method known as **targeted intervention**, students can be made to realize the value of their course work. The consequence of this intervention is to raise academic performance, such as their grades, retention, and career choice persistence (Harackiewicz & Priniski, 2018). For instance, Canning and co-researchers (2018) used targeted intervention by having introductory biology students select specific information from a course and write "… explaining *why* this specific information is relevant to your life or useful to you" (p. 838). This intervention made students aware of the course utility and value. The control group, who did not write such an essay, became much less aware of the utility and value the information had for them. As Figure 1.5 shows, students who wrote why the course was relevant for their personal, academic, and professional lives earned a higher grade in the biology course than did the control students. Thus, becoming aware of the utility and value of an endeavor increases one's motivation to succeed.

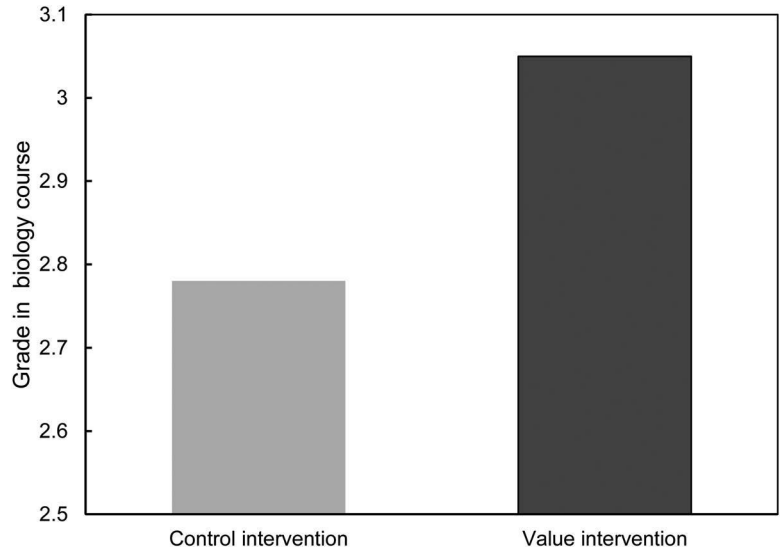

FIGURE 1.5 Utility Value Intervention Effect. Introductory biology students wrote why specific information from the course was relevant or useful for their lives. As a consequence, they earned a higher course grade than control students who wrote about the information only.

Source: Canning et al. (2018, p. 842).

Internal and External Motivation Combine

Individuals have no problem in doing what they want. In other words, when internal motivation is high the behavior occurs. Individuals also have no problem in doing what is necessary to obtain a highly valued incentive. But what if either want, value, or both are low. Will people motivated behavior still occur?

Internal and External Motivation Link

In the internal/external motivation distinction, internal motives push and external incentive pull. But, imagine being pushed without direction or pulled by something unknown—that is, having no preference? For example, when hungry, do you prefer food or water; when sleepy, do you prefer a bed or bicycle; when lonely, do you prefer a friend or TV; and when anxious from the dark, do you prefer to walk home alone or with a friend? People's choices are not random. In all instances, internal push and external pull are linked—that is, the internal motive pushes the individual toward a complementary external goal, such as hunger to food or loneliness to friends. Thus, the goal that motivates behavior depends on the individual's internal motive, such as hunger, sleepiness, loneliness, or anxiety.

But, how does the internal motive cause an individual to seek the complementary goal—that is, seek food when hungry, lie down when sleepy, or text a friend when lonely? Psychology provided some answers nearly 70 years ago. First, the utility and value of the incentive depends on the intensity of the motive. Thus, early psychologists like Lewin (1936) and Tolman (1932) maintained that increases in motive strength increased the value and *demand* of the complementary incentive. For instance, hunger makes food more valuable, sleepiness makes a bed more valuable, and anxiety makes safety more valuable. Consequently, the demand for food, bed, and safety increases. Second, individuals must be aware of their internal motives, but how is that possible? For example, can you differentiate among the sensations that indicate hunger, sleepiness, loneliness, or anxiety? Awareness of these sensations come from **interoception**, which means perception of the internal sensations or stimuli coming from inside your body, such as awareness of hunger versus sleepy versus loneliness versus anxiety. Third, since each motive feels differently, it can guide a person toward a complementary incentive (Hull, 1943). For instance, hunger feels different than loneliness. Thus, hunger guides a person toward food, while loneliness guides a person toward friends. Finally, how do individuals know what incentives, goals, or behaviors will result in need reduction or goal achievement? One answer relies on the concept of *associationism*, which refers to the connection between a drive or psychological need and the incentives and behaviors by which the need is reduced. First, there are innate drive-incentive connections. In other words, there was an existing evolutionary connection between certain drives and their relevant incentives, such as hunger with food, thirst with water, and relief with the reduction of intense stimulation. Second, organisms acquire the connection between drives and their associated incentives. In other words, organisms learn what incentives reduce a currently active drive. This association developed because drive intensity is repeatedly reduced by the same incentive (Hull, 1943, 1952).

Selection by Consequences

A second view of how people learn to reduce needs or achieve goals is a process known as **selection by consequences** (Catania, 2013; Skinner, 1981; Wasserman, 2012). Behaviors

are selected by the consequences they provide. Thus, if a particular goal is the desired consequence, then it selects behaviors that will achieve that goal. For example, hunger reduction selects for eating, loneliness reduction selects for affiliation, and anxiety reduction selects for walking with friends. Consequently, the success provided by these achievement behaviors makes them part of an individual's repertoire of goal behaviors. Other behaviors that do not result in goal achievement extinguish—that is, they are no longer maintained in the person's repertoire. To illustrate with a practical example, imagine the goal of successfully completing the requirements for a college course. Students behave in various ways but only preparing for class leads to success, while socializing, sleeping-in, or playing computer games does not. Preparing for class, say, a minimum of two hours per week provides minimal success. Increasing the time spent preparing for class definitely increases the chances of success. Thus, success in a course selects such behaviors as studying, reading, writing, analyzing data, rehearsing, and doing lab or homework. Furthermore, doing more of these academic behaviors leads to greater success, such as higher grades, scholarships, and graduate school acceptance. As a result of selection by consequences, time spent on class preparation increases to an average of nearly 15 hours a week for seniors (NSSE, 2015). Thus, longer class preparation becomes ingrained in a student's academic behavior repertoire. Other behaviors like socializing, sleeping-in, or computer games extinguish and fade from the student's repertoire of course achievement behaviors. Thus, selection by consequence means that the desired end-state selects for those behaviors that allow the end-state to be reached.

Selection by consequences imply that humans are passive responders to their environment. It implies that humans respond at random and keep successful behaviors and discard failures. The view that humans act passively is an incomplete portrayal of human motivation. Instead, humans create the environments in which they live. According to Bandura's (2006) **agentic theory**, rather than merely reacting, humans also intentionally create the circumstances of their lives. People are the agents of their behavior. They are not slaves to their environments and instead seek out or create environments to satisfy their different psychological motives (John & Robins, 1993; Winter et al., 1998). For example, one could speculate that most individuals who possess a stable need to belong will seek careers that will allow them to affiliate with others (Winter et al., 1998). In the case of people who differ in the level of extraversion, extraverts are more likely to prefer large parties than introverts are likely to prefer (Argyle & Lu, 1990).

Moreover, people are agents in their environments in several ways (Bandura, 2018). *Forethought* allows people to set goals, plans for achieving those goals, and anticipating the outcomes of those plans. Forethought resembles cognitive motivation. For example, with forethought a student is able to formulate a goal of a university degree, make plans for achieving that degree, and anticipate the outcomes when those plans are set in motion. *Self-reactiveness* is a second feature of a person as agent. Do individuals have standards to which they compare their behavior? Judgments of success versus failure, moral versus immoral, or beneficial versus detrimental are possible reactions to a person's self-imposed standards. For example, pride is a positive self-reaction toward one's behavior, while shame or guilt is the opposite. Finally, *self-reflectiveness* refers to people pondering about competing values, various possible goals, different courses of action, their capabilities, and finally deciding on a course of action. How much thought did you put into your choice of university, academic major, and intended career?

Motivational Readiness

In a person's repertoire of behaviors some work better than others in a given situation for attaining a desired end-state. What behavior does a person expect will work best? The **theory of motivational readiness** refers to a person's willingness to attain a specific end-state like those expressed in Figure 1.1 (Kruglanski et al., 2014). Motivational readiness depends on a person's want and the expectancy that the want will be satisfied. *Wants* refer to desires, motives, drives, needs, or wishes. An individual's environment contains resources called *affordances*, which are entities capable of satisfying wants. An expectancy is an individual's belief about the likelihood that an available affordance can satisfy a current want. Moreover, the effectiveness of an affordance depends how closely its features match or complements the features of a want. This match determines the degree of expectancy that the affordance will satisfy the want. For example, food is a better match for hunger than water is. Consequently, food produces a greater expectancy than water does for the ability of food to satisfy hunger. Figure 1.6 uses the need to affiliate to illustrate motivational readiness. Imagine the end of your romantic relationship, being new on campus, plus awaiting notice of your acceptance into a graduate school. These three events may create feelings of rejection, loneliness, and anxiety, which in turn give rise to the need to affiliate. By being with another individual, a person is better able to cope with these feelings. The need to affiliate, in this case, is classified as a want in motivational readiness theory. An individual's environment may contain any of the affordances on the right side of Figure 1.6. These affordances, however, vary

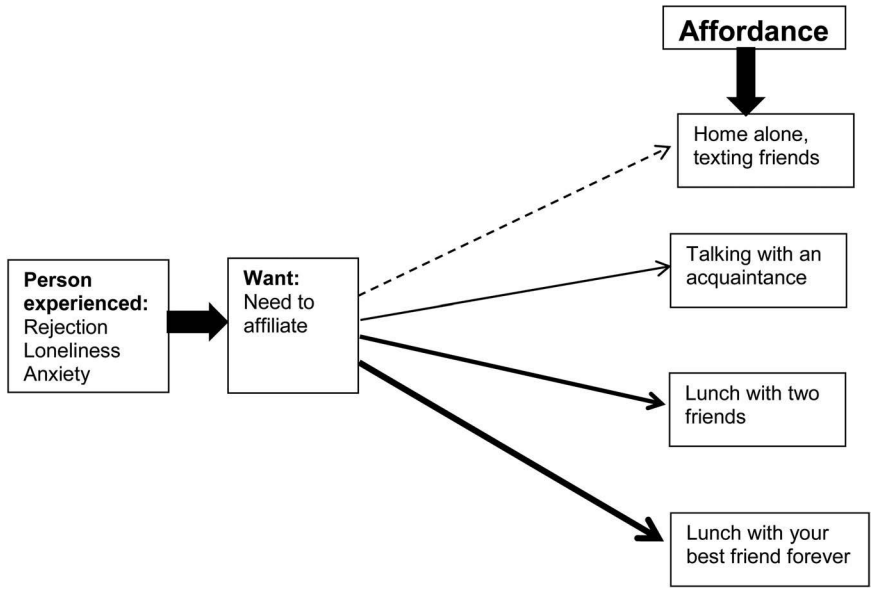

FIGURE 1.6 Degree of Match between Want and Affordances. The Want varies to the extent it matches onto the four environmental Affordances. The degree of match between the Want and Affordances increases from top (dashed arrow) to bottom (wide arrow). As the match increases, the expected likelihood of satisfying the want increases. Furthermore, with increasing degrees of match, the Affordance approaches an incentive or becomes the most effective incentive (Kruglanski et al., 2014).

in their capacity to satisfy the want. Lunch with your best friend forever has the capacity to satisfy all features of the need to affiliate, whereas the other affordances can satisfy only some of them. For example, your best friend can console you better about the romantic break-up, reduce your loneliness more, and a delicious lunch can momentarily relieve your anxiety. The other affordances in Figure 1.6 can only satisfy some of the features of the want. Based on motivational readiness, increases in the match between the want and the affordance, increases the individual's expectancy that the need to affiliate will be satisfied. In such a case, the best affordance becomes the most effective incentive.

Internal and External Motivation Strength Varies

Finally, internal and external sources jointly motivate behavior. Drives and needs can range from weak to strong and incentives can range from small to large. Behavior will occur if their combined effects exceed some necessary threshold (see Figure 1.7). When above the threshold, behavior occurs; when below, it does not (Kimble, 1990). Thus, behavior can result from little external motivation, provided that there is plenty of internal motivation. For example, the food may not be very tasty but a hungry person will eat it. Or behavior can occur with little internal motivation, provided there is plenty of external motivation. For example, even though a person may not be very hungry, he will still eat a bowl of delicious ice cream. Figure 1.7 also shows why motivating changes. This is because peoples' internal states can change from weak to strong or from strong to weak. Motivation also changes even if internal states do not. This happens when the value of an incentive or goal changes. Thus, how motivated an individual is to obtain shoes, a smartphone, a tablet, or college education depends on what those are worth—that is, how much value is placed on

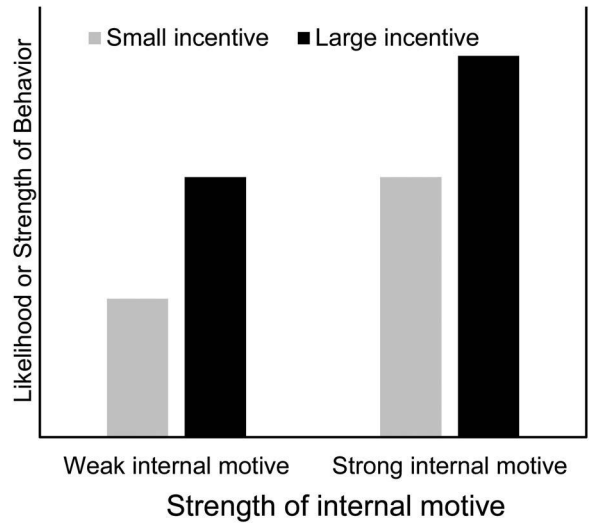

FIGURE 1.7 Internal and External Sources Combine to Motivate Behavior. The combined effect of internal and external sources of motivation must exceed the threshold for behavior to occur. Also, as their single and combined effects strengthen the intensity of behavior increases also. Motivation is weakest for small incentives paired with weak internal motives but is strongest for large incentives paired with strong internal motives.

the utility of those items. So, the study of motivation is to determine how internal states and value systems link up with external events. These links motivate behavior.

The Past as a Source of Motivation

This book describes what motivates humans. What characteristics about people in general, groups of individuals, or you in particular would help us understand what is motivating? Is there a common thread among these characteristics that is relevant for motivation? If so, then from where and how did these characteristics originate? One view is that they come from our evolutionary past.

Our evolutionary past is responsible for what can be called *human nature*, which refers to the behavioral, motivational, and emotional similarities among people. Human nature is the outcome of human evolution. The concept of **evolution** originated with Charles Darwin in his book *On the Origin of Species by Means of Natural Selection* (1859/1936). Evolution consists of variation and two types of selection. *Variation* means that different values of a particular trait vary in frequency in a population. *Natural selection* means that certain trait values are selected by the environment and aid survival (Endler, 1986). Another type of selection, known as *sexual selection*, refers to one person choosing a mate based on his or her characteristics; for example, choosing the prettiest, most dependable, or nicest mate.

Natural Selection

In the case of **natural selection**, the evolution of the running speed of cheetahs is an example (see Figure 1.8). Cheetahs vary in running speed: slow, medium, and fast. The ability of a cheetah to obtain food depends, in part, on how fast it runs. When all their prey is slow, all cheetahs are able to eat. Even the slowest cheetah is fast enough to run after the slowest prey. However, if all the slow prey are eaten, then only faster-running cheetahs will survive, since only they are able to catch the remaining faster-running prey. Thus, the faster-running prey selects for faster-running cheetahs and selects against slower-running cheetahs. Consequently, faster-running cheetahs have a greater chance of survival than slower-running cheetahs, since the faster ones are more likely to capture the prey they need for food. Darwin (1859/1936) also reasoned that physical traits are inherited. Thus, the physical equipment for fast running, such as powerful muscles, strong heart, and lung capacity, is transmitted to succeeding generations.

In addition to physical traits, psychological motives have also resulted from evolution. An example is the motive for affiliation. But how would a motive for affiliation arise? The philosopher Herbert Spencer (1881/1977) contended that pleasure supports behaviors that benefit life, while pain prevents behaviors that harm life. Thus, behaviors that give rise to pleasure will persist while behaviors that give rise to pain will cease. This idea had also occurred to Darwin (1873) in regard to people affiliating together in groups. On the one hand, affiliating with others provides pleasure, while isolation is painful. In addition, affiliation provides benefits in the form of comfort and aid from others and also better protection from various dangers. On the other hand, individuals who cared less about their fellow humans would be more likely to perish in greater numbers. In other words, liking to affiliate with other people increases a person's chances of survival, while not doing so decreases a person's chances. Furthermore, traits like affiliation are also transmitted to succeeding generations.

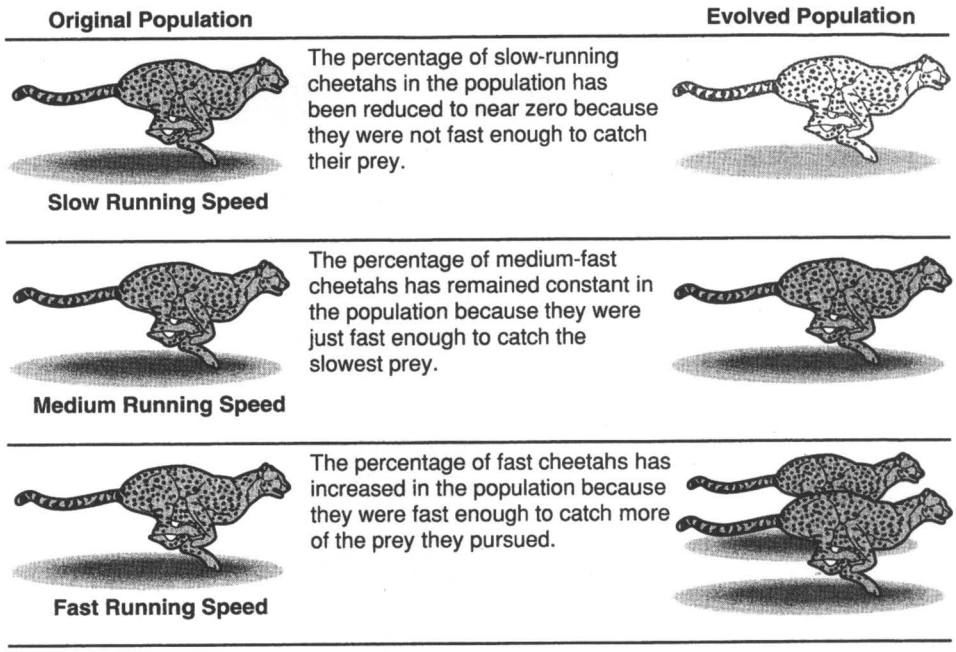

FIGURE 1.8 Variation and Selection in Evolution. The percentage of slow-, medium-, and fast-running cheetahs changes over succeeding generations. Slow-running cheetahs decrease in the population because they are not fast enough to catch even the slowest prey. Medium-fast cheetahs hold their own, since they can catch the slowest prey. Fast-running cheetahs increase in the population because they can catch a greater amount of the prey they pursue.

Sexual Selection

Natural selection, however, is not the only type of selection. The point of natural selection is to ensure survival and longevity. However, living a long time because of natural selection may benefit an individual but may not benefit the species. For a species to receive the benefits of natural selection, adaptive traits must be passed on to succeeding generations. Darwin (1859/1936) used the term **sexual selection** to refer to "[a] struggle between the individuals of one sex, generally males, for the possession of the other sex. The result is not death to the unsuccessful competitor, but few or no offspring" (p. 69). The male could be very aggressive and fight off all other males, thereby having a harem of females all to himself. However, if he could not be the most aggressive then maybe he could be the most charming and attract the most females in that manner. In such cases, the female acts as the selecting agent because it is what she likes about the male that determines whether she allows him to mate with her. For example, the number of copulations performed by a peacock correlates positively with the number of eyespots on his train of tail feathers. The greater the number of eyespots, the more likely a peahen is to consent to copulation (Petrie et al., 1991).

A video of pea hens sexually selecting peacocks for their train of tail feathers is available at http://www.youtube.com/watch?v=gKybAp--n7M

Population Thinking

In Darwin's concept of evolution, selection depends on variation. Without variation all traits would be identical. Consequently, there would be nothing to select from. However, variation or differences among people provides a challenge in determining what motivates them. In fact, differences among people stem from an idea also introduced by Charles Darwin in his theory of evolution: **population thinking**. This idea refers to the observation that every individual in a population is different (Mayr, 2001). Thus, rather than emphasize that individuals are similar, population thinking emphasizes that individuals are unique. Think of the human face, for example. In some sense, every human face is the same but yet every face is different—that is, unique. An implication of population thinking is that various aspects of motivation do not apply equally to all individuals, much like the average size shoe does not fit everyone. Population thinking justifies phrases like one person's pain is another person's pleasure or one person's junk is another person's treasure. In psychology, population thinking translates into the area of individual differences, such as psychological needs (Chapter 7) and personality traits (Chapter 8). In other words, people differ in the strength of their psychological needs and differ in the level of their personality traits. For example, people vary in their need to affiliate and thus each person expends different amounts of effort in order to associate with others. Individuals with a stronger need to affiliate would be more motivated to seek out and associate with others. People also vary in personality traits. For instance, more extraverted individuals might expend additional effort to attend parties than less extraverted individuals would.

The Scope of Motivation

If motivation is the inducement of an individual's actions, thoughts, and feelings, then what is the source of this inducement? As the book's title implies, psychologists can look to the biological—that is, the nature of the body and specifically the structure and workings of the brain. Part of the biological view is the consideration of how the brain evolved. What function did it play in our evolutionary past and how does that function affect human motivation today? The psychological refers to properties of the human mind, in contrast to the body and brain. The psychological is represented by motives, such as psychological needs, wants, and desires, but also by other characteristics, such as personality traits. And finally, the environmental can be divided into two categories. The first concerns the objective environment—that is, material things, such as money, grades, or prizes. The second concerns the cognitive representation of some external event, which is a case of cognitive motivation. For example, graduation is not a thing but the mental representation of some event that a student can visualize in her mind's eye. The mental representation is the goal which attracts or draws a student toward it. However, if a mental representation is viewed negatively, then it would actually repel the individual and provide motivation for behavior so that it would not happen.

Furthermore, the sources of motivation cut across various disciplines within psychology. Biological sources are a main consideration in disciplines that examine motivation and emotion in terms of an organism's autonomic and central nervous systems. These areas are covered in biological psychology, cognitive and affective neuroscience, and in neuroscience outside of psychology. The relationship between arousal and performance is considered in

sports psychology, and the relationship between stress and well-being is covered in health psychology. Internal sources, like psychological needs, personality traits, and self-esteem are included in the areas of social psychology, personality, and personal growth. Psychological needs are also examined in consumer psychology and advertising. In addition, social psychology often covers emotions, since other individuals are a major source of emotional experiences. Environmental sources of motivation, such as incentives, are found in courses on learning, conditioning, and behavior analysis. Behavior modification, for instance, relies heavily on external incentives to change behavior. Incentives and goals also receive treatment as a part of industrial psychology and work motivation. Finally, clinical psychology and the study of psychopathology also include the topic of motivation. For instance, amotivation (the complete absence of any motivation) and the overpowering motivation for drugs (as in addiction) are two opposite ends of the motivation continuum studied in these fields.

Section Recap

This section described the different sources of motivation. The body/brain and the mind are both internal sources of motivation. The body/brain involve the biological aspects, such as ghrelin indicating the amount of food energy available in the body. Increases in the level of ghrelin increases the motivation for eating. In contrast, a person's mind is a psychological source of motivation like drives and psychological needs. Drives and needs motivate a person to those incentives and behaviors that will reduce the drive and satisfy the need.

External sources of motivation refer to incentives and goals. For Hobbes (1640/1962) the concept of *incentive motivation* is based on valence—that is, the positive or negative quality of the incentive. Positive incentives are approached because they produce pleasant feelings, while negative incentives are avoided because they produce unpleasant feelings. Bentham's (1789/1970) *principle of utility* refers to the idea that the consequence of our behavior determines whether our happiness increases or decreases. The utility of an object refers to its capacity to increases happiness or decreases unhappiness or pain. The value of utility can be increased with *targeted intervention*, which refers to motivating a person to realize the value of a particular activity, such as students valuing their course material.

Internal and external motivation are linked to together. First, a person is aware of their biological and psychological needs through *interoception*, which refers to being conscious of internal body sensations like hunger or loneliness. *Associationism* is the link between the biological or psychological need and the environmental entities that will satisfy the need. *Selection by consequences* means that a desired end-state or goal selects the behavior that makes achievement of the goal possible. However, people do not merely react but also act by anticipating, selecting, creating, or altering their environments according to *agentic theory*. *Motivational readiness* is a theory that links satisfying a psychological need with affordances (potential incentives). Readiness refers to the expectancy that a person's want will be satisfied by affordances that are available to a person. Finally, behavior depends on both the strength of internal and external sources of motivation. Behavior can occur if internal motivation is weak, provided external motivation is strong and vice versa.

Darwin (1859/1936) was one of the originators of the *theory of evolution*, which accounted for the change in frequency of physical traits but also psychological traits like affiliation. From variation among traits, the environment operates through *natural selection* to favor traits that

aid in the organism's survival. According to Darwin's concept of *sexual selection*, members of one sex choose individuals of the other sex based on the latter's characteristics. *Population thinking* stems from the concept of variation and emphasizes that each individual is unique, which translates into individual differences in psychological needs and personality traits.

The study of motivation involves the study of biological variables—that is, what do the body and brain contribute? The study of psychological variables involves examining how mental processes contribute to motivation. Environmental variables are examined to determine how material incentives, goals and their mental representations motivate individuals. Finally, the study of motivation is applicable to many different disciplines.

GLOSSARY

Affect The subjective feeling part of an emotion to be contrasted with sensations of hunger or thirst, tired or sleepy, hot or cold.

Affective Forecasting When a person predicts his or her subjective feelings (affect) much like the weather reporter forecasts the weather.

Affordance Resources or entities in an individual's environment that are capable of satisfying wants, e.g., psychological needs.

Agentic Theory Bandura's theory that humans willfully create or alter their circumstances, which in turn affects their behavior.

Anticipatory Behavior Miniscule responses that resemble actual consummatory responses that occur when a goal is being achieved.

Anticipatory Response Mechanism Miniscule consummatory responses elicited by stimuli associated with the goal; the mechanism describes prediction or looking forward to the goal.

Associationism The connection or link between a drive or psychological need and the incentive or behavior that will satisfy that drive or need.

Biological Characteristics of the material body or brain and how that relates to motivation.

Cognitive Motivation Visualizing the end-state or goal of the motivation sequence and mentally perceiving a plan or script to achieve that goal.

Consummatory Behavior From the verb to finish, as in finishing the motivation sequence when the person interacts with the goal, e.g., eating or affiliating.

Demand How much an incentive or reward is wanted or desired based its utility and value.

Drive Motivation construct that results from being deprived of a needed substance. It acts like an internal stimulus that motivates action to reduce drive.

Emotion An evolved coordinated effort among physiological, psychological, and behavioral dimensions in order to cope with an environmental demand or problem.

End-State The aim or purpose of motivation like attaining incentives, achieving goals, or satisfying needs.

External Source Entities in the environment that motivate behavior via their pull, e.g., incentives and goals.

Evolution (Theory of) According to Darwin, from differences among traits, the environment selected traits that aided the organism's survival and that of its offspring.

Evolutionary Past Accumulations of the effects of millions of years of natural selection that reside in a person's genes.

Ghrelin A hormone residing in the stomach that promotes hunger and eating; example of a biological variable.

Goal The cognitive representation of a selected end-state that a person commits to and is pulled toward achieving.

Hedonism Motivation principle that emphasizes the pursuit of pleasure and the avoidance of pain.

Human Nature The behavioral, motivational, and emotional similarities among people worldwide that are a result of human evolution.

Incentive A valued feature of the environment that motivates an individual to attain it, if positive, and avoid it, if negative.

Incentive Motivation To be motivated to approach positive environmental events (positive incentives) and to avoid negative environmental events (negative incentives).

Instrumental Behavior Motivated activities that a person performs that will lead to the satisfaction of a motive, attaining an incentive, or achieving a goal.

Internal Sources These are biological or psychological needs within a person. They motivate behavior toward an entity that reduces or satisfies the needs.

Interoception A person's perception of internal sensations or stimuli coming from inside one's body, e.g., hungry versus sleepy; lonely versus anxiety.

Motivated To be moved into action or change in action by the push of a motive or the pull of an incentive.

Motivation The process by which a person is pushed or pulled toward a selected end-state comprised of a concrete goal, consummatory behavior, or subjective feeling.

Motivational Readiness (Theory of) It is the expectancy that an individual's wants will be satisfied by possible available incentives known as affordances.

Motive An internal disposition (hunger, desire, need, want) that pushes an individual toward a desired end-state or goal.

Personality Traits Consistency in a person's behavior in similar situations on different occasions.

Population Thinking Based on Darwin's concept of variation; it emphasizes how each individual is unique, as in differences in psychological needs and traits.

Psychological Need Similar to drive, it referred to an existing psychological deficit. People are motivated to reduce the deficit—that is, satisfy the need.

Push/Pull Motivation Idea that motives push and incentives or goals pull people into action.

Selection From theory of evolution that certain values of a trait are favored or chosen by the environment or by another individual for mating. These traits aid survival.

Selection by Consequences The reinforcing consequence of behavior acts to select the behavior and make it more likely to occur, e.g., a goal select goal-achievement behavior.

Simulation Anticipated psychological experiences that occur as if the individual were actually visualizing, interacting, or imagining an end-state.

Targeted Intervention Techniques that help students realize the value of their course work and thus motivate and raise their academic performance.

Utility (Principle of) Decisions and actions are motivated by the usefulness of incentives to increase happiness or satisfaction and decrease unhappiness or dissatisfaction.

Valence Positive and negative features of an incentive. Positive features attract an individual to an incentive while negative features repel.

Variation Basic concept in Darwin's evolution, different values of a particular trait vary in frequency in the population.

Wants In motivational readiness theory, it refers to desires, motives, drives, needs, or wishes.

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CHAPTER 2

Evolutionary Antecedents of Motivation

Human nature is the same all over the world, but its operations are so varied by education and habit that one must see it in all its dresses in order to be entirely acquainted with it.

—Lord Chesterfield, 1747

Human action can be modified to some extent, but human nature cannot be changed.

—Abraham Lincoln, 1809–1865

Does human nature refer to characteristics of motivation that all people have in common? Is there a core of motives and goals that all people share? Consider the following:

1. What is human nature, and how does it relate to motivation and emotion?
2. Are there dispositions that serve as universal motives for all humans?
3. How did evolution and the social environment motivate human mate preferences, reproductive behavior, and the onset of jealousy?
4. What is the contribution of evolution to fear, food preferences, and the enjoyment of music?

EVOLUTIONARY PERSPECTIVE ON MOTIVATION

Where in people's past is the origin for the motivation of their current behavior? By way of analogy, what caused the fall of the last domino pictured in Figure 2.1? Some event must have toppled the first domino, which eventually led to the fall of the last one. Is the immediately preceding domino responsible for the fall of the last one or is it the one prior to that one and so on back to the initial event? Similarly, is the understanding of what motivates people today in their recent past or in their remote past?

Evolutionary History and Personal History

How does evolutionary history and personal history determine an individual's current motivation and emotion? Does our evolutionary past combine with individual environmental and cultural experiences to determine what does or does not motivate us?

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FIGURE 2.1 A Metaphor for Evolutionary History and Personal History. The toppling of the initial dominoes represents evolutionary history, which topple later dominoes that represent personal history. The 10th or last domino represents motivated behavior in the present.

What Shaped Human Nature?

From an evolutionary perspective, motivation pushes and pulls people toward the most basic of goals: the survival and transmission of their genes to the next generation. Achieving this goal involves surviving, finding and keeping a mate, producing children, and raising them successfully so that they can repeat the process for the next generation (Bernard et al., 2005). This process has been repeated over and over during human evolutionary history. The result has been a set of behaviors that all humans have in common in spite of vast geographical, social, and cultural differences. As described in the previous chapter, **human nature** refers to the behavioral, motivational, and emotional similarities among people that resulted from their common evolutionary history. They are disposed to behave in a particular fashion, depending on their situation. Human nature is most striking when similarities occur in spite of environmental and cultural differences. It is shaped by natural selection and sexual selection, and is genetically transmitted from one generation to the next. Human nature is universal, which means it is the same in societies all over the world.

Evolutionary and Personal History Interact

Human evolutionary history interacts with our personal history much like the fall of later dominoes depends on the fall of earlier ones (Figure 2.1). The interaction between evolutionary history and personal history is another way of stating that the interaction between heredity (nature) and environment (nurture) motivates behavior. The nature of this interaction was recognized over 135 years ago by Sir Francis Galton (1883). He claimed that it was difficult to distinguish between the part of human character that results from education and circumstances and that which results from the human constitution. Today, we accept that both heredity and environment interact to determine behavior (Plomin et al., 2013).

The relative contribution of heredity and environment differs for various behaviors. Some behaviors are genetically disposed to occur and thus require little environmental

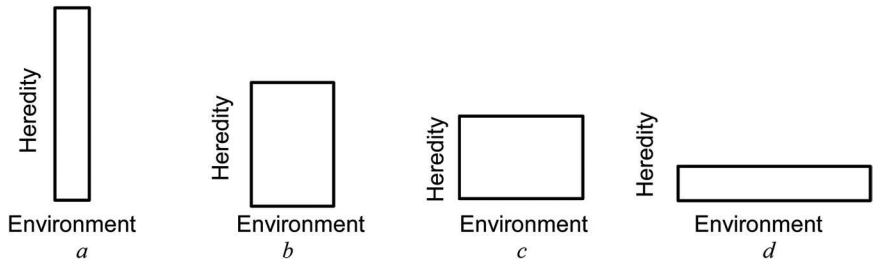

FIGURE 2.2 Relative Contributions of Heredity and Environment. Length and width both contribute to the area of a rectangle, since Area = Length × Width. The relative contribution of length decreases, and width increases from a to d, yet both length and width still contribute to the total area of each rectangle. Similarly, heredity and environment both contribute to the motivation of behavior. The relative contribution of heredity decreases and that of environment increases from a to d, yet both heredity and environment still contribute to the motivation of behavior.

experience. Other behaviors are genetically neutral and require much environmental experience to occur. For instance, learning to eat is almost automatic, whereas it takes a lot of practice to master long division. Figure 2.2 uses a series of rectangles to illustrate the interaction between heredity and environment for motivating behavior (Plomin et al., 2013). A rectangle's length and width both contribute to its area, since Area = Length × Width, although the relative contribution of each may vary. Similarly, heredity and environment both contribute to behavior, but their relative contributions may also vary. Changes in the contribution of heredity and environment are illustrated by rectangles *a* through *d* in Figure 2.2: the contribution of length (heredity) decreases, and the contribution of width (environment) increases. Although the change from rectangle *a* to rectangle *d* represents a decrease in heredity and an increase in environment, both heredity and environment contribute. Behaviors that are strongly influenced by heredity (rectangle *a*) are known as *innate*, which means not taught or not benefiting from experience.

It is important to remember, however, that heredity can influence behavior in more than one way. First, consider how size and strength differences between men and women contribute to a general division of labor. Men, on average, are bigger and physically stronger and so tend to do heavy work, such as farming, mining, and construction. Women, on average, are smaller and have less muscle mass and so tend to do lighter work, such as clerical tasks. However, today because of technology and machinery most behaviors can be performed equally well by both sexes. Second, the hereditary nature, or innateness, of certain feelings or motives dispose humans to react in one way rather than another to various stimuli. The influence of these seemingly innate feelings becomes apparent in the prevalence of sexual behavior, certain fears, a baby's taste preferences, and the universal pleasure of music. Finally, heredity can influence the environment because individuals choose, alter, or manipulate their environments according to agentic theory (Bandura, 2006, 2018). For example, people select their social environment through choice of friends, their academic environment through choice of university, and their geographical environment through choice of where to live. People's genetic makeup or heredity helped determine these choices. Their chosen environments, in turn, affect their behavior. Thus, your friends, your university, and where you

live all help determine your behavior. The basis of these choices resides in the individual's genes. The fact that genes choose their own environments is known as **gene-environment correlation** (Plomin et al., 2013).

Experience and Motives

As the rectangles in Figure 2.2 illustrate, even behaviors that appear to be totally innate may actually require at least some minimal environmental experience to occur (rectangle *a*). Other behaviors require the benefit of additional experiences (rectangles *b* through *d*). To illustrate, we might think of walking as being innate, but some prior experience in sitting upright and crawling appears necessary for walking to occur in a timely manner (Dennis, 1960). Other examples are an infant's crying to indicate hunger or distress. This behavior is fairly complete immediately following birth. As new parents quickly learn, their baby requires little if any practice at this activity. Facial reactions to taste stimuli also seem to be in place in the first few hours of an infant's life. Little practice, if any, is needed to indicate whether something is tasty or awful (Mennella & Beauchamp, 1998; Steiner, 1977). Finally, an individual's innate disposition and personal experience usually operate in tandem, which happens, for example, in the development of gender roles. Infants identified as girls and boys are nurtured along feminine and masculine roles, respectively.

Evolutionary Psychology

Human minds are not blank slates at birth upon which experience writes. Neither are minds passive recipients of experience. Instead, human minds have been shaped by evolution to adapt to their environment. Imagine what the environment was like millions of years ago, in say, Africa. During that time in human evolutionary history, people lived as hunters and gatherers in small groups with many people related to one another. Individuals cooperated in gathering edible plants, hunting animals, finding shelter, avoiding dangerous animals, seeking safety, finding mates, and raising children. This lifestyle lasted millions of years. During that time, natural selection operated to solve frequently occurring struggles and difficulties. Those individuals who were more successful at accomplishing these activities were selected for—that is, they were more likely to survive and pass on their genes to their children. Thus, the effect of past natural selection interacts with people's current environments to determine their motivation. This interaction is the view of evolutionary psychology, which analyzes universal motives in the context of evolution.

Universal Motives

The fast running of cheetahs and eyespots on the peacock's feathers are physical traits that evolved through both natural and sexual selection. Psychological traits, known as **psychological mechanisms**, evolved similarly to solve specific problems of adaptation to the environment (Buss, 2019). *Universal motives* are a particular type of psychological mechanism that refer to the commonality of motives. Fear, such as that of snakes, for instance, evolved to motivate behavior to escape or avoid such dangerous creatures. Food preferences for sugar and fat evolved to ensure a person liked food that provided adequate calories. Women evolved a preference for mates who had the economic resources to provide for them and their children. Male attraction to beauty and desire for sexual variety evolved to ensure the

TABLE 2.1 Categories of Universal Motives

Universal Motive/Incentive	Characteristics
Aesthetics	Art, hygiene, music, standards of beauty
Control environment	Fire, mood altering substances, shelter, tools
Emotions	Anger, contempt, disgust, fear, happy, sad, surprise
Facial expressions	For emotions, for communication, and are modifiable
Fears	Loud noises, snakes, strangers in childhood
Goal setting	Predict and plan for the future
Self-concept	Self as subject, object, and different from other persons
Sexual interactions	Attraction, sexual jealousy, and regulation
Social milieu	Live in social units, rights, obligations of membership, and status

Source: Based on Brown (1991, chapter 6).

selection of fertile mates and to motivate the seeking of more sexual partners. The function of male sexual jealousy evolved to increase a man's confidence regarding the paternity of his children. Each human motive can be considered an instance of a psychological mechanism that evolved because it aided humans in adapting to their environment.

To learn more about evolutionary psychology, go to http://www.cep.ucsb.edu/

For a motive to be considered universal, it must occur in all countries and cultures of the world, even though it might be expressed differently. Brown (1991) uses the term **universals** to describe traits that are found in almost all cultures and societies. Some items in his list can be categorized together for their relevance to universal motives and universally valued incentives (see Table 2.1). Emotional behaviors seem to dominate the list as reflected by the presence of fears, emotions, and their accompanying facial expressions. The social nature of human motives is exhibited in categories of sexual interactions and people's social milieu. Universals with external characteristics express themselves in terms of controlling the environment and setting goals for preventing and alleviating stress. Universals that seem more removed from human biology are beliefs about aesthetics and concepts about the self. The universal motive categories in Table 2.1 are taken for granted. We forget that entire institutions and customs have developed to satisfy these motives or attain these valued incentives in today's societies.

Inherited Structures for Behavior, Motives, and Emotions

How can universal motives, such as fear or food preferences, evolve and pass on to succeeding generations? They do so by way of an individual's genes that transmit universal motives to the next generation (Mayr, 2001). **Genes** are those parts of a person's DNA content that provide the information necessary for the construction of proteins. In turn, proteins form the brain and nervous system. Humans receive one-half of their genes from each parent at conception. At this time, the sperm containing the male's genetic information unites with the egg, which contains the female's genetic information. The resulting combination contains information from each parent, which in turn came from their parents, and so on. Our genes or our genetic past do not influence motivation or behavior directly. Genes provide the information for the building of proteins that are used to "create the skeletal system,

muscles, the endocrine system, the immune system, the digestive system, and most important for behavior, the nervous system" (Plomin et al., 2013, p. 44). To say that genes or heredity influence behavior is really a shorthand way of stating that genes are the recipes for various proteins, which in turn produce neurophysiological systems that determine the particular reaction to environmental stimulation (Plomin et al., 2013). Thus, the genetic inheritance of motives or psychological mechanisms simply means that the brain or body appears sensitive to the stimuli that evoke or satisfy those motives. For example, different neurons in the tongue and brain react to sweet and bitter stimuli such that infants prefer sweet tastes. Genes carry the information for how the tongue's neurons and the brain's structure are constructed. At a more global level, however, variation and selection occur at the level of behavior. After all, behavioral and environmental events are visible, while genes are not; only their end results are visible.

Evolutionary Mismatch Hypothesis

Evolution as a trial-and-error process results in human traits and behavioral tendencies that best fit the environment. However, all is not well for some behavioral tendencies that evolved in our past. The idiom of "a square peg, in a round hole" when applied to motivation suggests that some evolved psychological mechanisms are not fitting well into the current environment. The psychological mechanism actually detracts from an individual's well-being according to the **evolutionary mismatch hypothesis** (Li et al., 2017). Conditions that prevailed when psychological mechanisms evolved are no longer present today. So, rather than being harmless, they actually motivate individuals to behave in a manner that is not the best for them. For example, our current environment provides abundant delicious food, pleasure-inducing drugs, labor saving devices, and virtual realities, all of which have a downside.

Section Recap

The motivation for current behavior has its roots in our evolutionary history and personal history. Evolutionary history refers to a person's genetic make-up or *human nature*, which encompasses all the behavioral, motivational, and emotional characteristics that all people have in common despite environmental and cultural differences. Personal history refers people's environmental and social experiences. Both genes and environment contribute to what motivates behavior, just as length and width both contribute to the area of a rectangle. Also, according to *gene-environment correlation*, people's genes help determine the social and natural environments that they select or modify. In turn, these selected environments influence people's behavior. In addition, tendencies that are part of human nature operate in tandem with personal experience, as in the development of gender roles. Evolutionary psychology proposes that part of human nature consists of *psychological mechanisms*, which evolved so that humans could adapt efficiently to long-term environmental problems in their evolutionary past. Universal motives are psychological mechanisms that refer to similarities in what motivates people, such as a set of basic needs, valued incentives, and social interactions. The term *universals* refer to traits and psychological mechanisms that are expressed and regulated in societies the world over. *Genes* are DNA segments that provide information from each parent on how to build the child's neurophysiological structures. These structures, in turn, are the physical basis for psychological mechanisms or universal motives. However,

sometimes behavior that resulted from evolution does not fit well with the current environment according to the *evolutionary mismatch hypothesis*.

UNIVERSAL MOTIVES FOR RELATIONSHIPS AND SEX

The motivation to form relationships appears universal. What do individuals look for in another person for establishing a long-term relationship? How are relationships maintained? Are there factors that interfere with our social interactions?

Motivation for Relationships

"They stroke, kiss, nip, nuzzle, pat, tap, lick, tug, or playfully chase this chosen one. Some sing. Some whinny. Some squeak, croak, or bark. Some dance. Some strut. Some preen. Some chase. Most play" (Fisher, 2004, p. 27). In her book *Why We Love*, Fisher gives many examples of various animals engaging in behaviors that we anthropomorphize as romantic love. In addition to this love play, animals, like humans, exhibit choosiness. They do not mate indiscriminately with members of the other sex. A further similarity is that animals, like humans, appear possessive and guard their mates closely. How do the psychological mechanisms of sexual desire, romantic love, sexual selection of a mate, and jealousy motivate the start and maintenance of relationships?

Two universal motives have evolved that are important for the continuation of the human species: sexual desire and romantic love. These are separate and independent motives that induce different behaviors (Berscheid, 2010; Diamond, 2004). If it were not for **sexual desire**, humans might consider sexual intercourse as requiring too much time or effort or as being too dangerous. This universal motive evolved, however, in order to motivate the sexual behavior that is necessary for conception and the eventual birth of a baby (Eastwick, 2009). Without sexual desire and subsequent sexual intercourse, there would be few, if any, offspring.

Feelings of sexual desire and orgasm help contribute to an accompanying emotion of **romantic love**. This emotion refers to a strong attachment that individuals have for one another and promotes long-term commitment. These feelings motivate the search for a long-term mate, which provides immediate and evolutionary benefits. First, an immediate benefit is the very pleasant feelings that an individual's partner elicits. In contrast, a partner's absence produces feelings of anguish, distress, and longing; a feeling to reduce or avoid (Shaver et al., 1996). A number of psychologists also maintain that, in addition to sexual attraction, romantic love involves emotional bonds and commitment (Fletcher et al., 2015), that is, factors that motivate a couple to remain together. Second, romantic love corresponds with the evolutionary perspective of motivation: survival and passing on of one's genes. Romantic love occurs worldwide; it is universal. For example, Jankowiak and Fischer (1992) consulted ethnographic files for the presence of romantic love in 166 societies from around the world. In 88.5% of them, they were able to document its occurrence.

How did love originate? It evolved as a psychological mechanism to solve the **commitment problem** (Buss, 2006; Frank, 1988). This problem refers to the necessity of one individual to be loyal and faithful to another for the survival benefits of both. What survival advantages arise from commitment that romantic love provides? First, imagine a person

who moves next door to a couple. The new neighbor is better looking, wittier, thoughtful, and richer. Or imagine that one member of the couple becomes sick, loses employment, or becomes depressed. Frank (1988) and Buss (2006) maintain that, in such instances, the likelihood increases that one member of the pair will leave for the more attractive neighbor. This switch would occur if people were strictly rational and without emotion. However, that is not the case. Romantic love in this instance will tend to keep the two individuals together—that is, to remain committed, even when there are more attractive alternatives. Second, parents' love for their children helps ensure the children's survival, especially when children are young and vulnerable. For example, young infants can be very demanding: they cry, scream, fuss, need attention, demand hugging, cuddling, and need diaper changes. Love commits parents to do all of those things for their children. Third, romantic love also reduces the motivation to search for another mate and to pay less attention to other potential partners. A final benefit of romantic love is that it promotes the division of labor, which also aids the survival and health of the couple and their children (Eastwick, 2009; Fletcher et al., 2015).

Good Genes Hypothesis

By means of sexual selection, humans are motivated to seek individuals with whom to mate, with whom to produce children, and with whom to raise the children successfully (Bernard et al., 2005). What characteristics in a potential mate promote the achievement of this goal?

Mate Value

How desirable are you as a mate—that is, what is your mate value? Are you

Extremely undesirable = 0 1 2 3 4 5 6 7 8 9 = *Extremely desirable?*

A person's **mate value** refers to his or her characteristics that are desired by the other sex. The higher your mate value, the greater is your appeal to others. With the *Mate Value Scale*, individuals rate themselves on their desirability as a partner, how they compare to other potential partners, and how good a catch they are (Edlund & Sagarin, 2014). A more detailed mate value inventory in Table 2.2 measures more specific characteristics of a person's mate value (Kirsner et al., 2003). What is desired in a mate consists of physical features (attractiveness), psychological characteristics (ambition, sense of humor, loyalty) as well as a value system. An attractive face and body are immediately noticeable in a person but fade with time and are ones to which the other person habituates. Psychological characteristics take time to discover and are less likely to fade. Finally, when interests and values are shared, it increases people's attraction to each other. Another characteristic that becomes apparent as a relationship progresses is **relational mate value** (Eastwick, 2016; Eastwick & Hunt, 2014). It refers to the amount of satisfaction that you derive from being in a relationship with that individual. For example, do you like or are you sexually attracted to the individual, are your psychological needs fulfilled by this individual, is this relationship better than others? Relational mate value indicates that over time individuals discover whether their unique relationships are desirable or not. As the saying goes: "What does she see in him?" She sees something unique, which makes their relationship valuable and enduring.

TABLE 2.2 Mate Value Inventory

Describe Yourself as Accurately as Possible on the Traits Listed Below. Use the Following Scale:		
Extremely low on this trait = –3 –2 –1 0 +1 +2 +3 = *extremely high on this trait*		
Ambitious[a]___	Faithful to partner___	Kind and understanding___
Attractive face[a]___	Financially secure[a]___	Loyal___
Attractive body[a]___	Good sense of humor___	Responsible___
Desire for children___	Generous___	Shares my values___
Emotionally stable___	Healthy___	Shares my interests___
Enthusiastic about sex___	Independent___	Sociable___

Source: Adapted from Kirsner et al. (2003, pp. 135, 147).

Note: To compute your mate value, sum your scores on all of the items. The total score reflects the amount of a person's mate value.

[a] Indicates that similar traits were used by Buss (1989) in 37 different cultures.

What Your Mate Value Motivates?

Although unromantic, think of your mate value as money. The more you have, the better quality of mate you can attract. Online dating markets are useful for determining a person's mate value and how that motivates the individual's pursuit of a mate. Imagine posting your dating profile on an online dating site. There, your desirability or mate value is determined by how many messages you receive plus the desirability of those who sent them. In other words, the more messages you receive from individuals who also receive many messages, the more desirable you are. Bruch and Newman (2018) calculated each person's desirability score from this information. They discovered that men and women sent messages to other-sex individuals who were a bit more desirable than themselves. For example, an individual, with a score of 3 might send a message to a 5 and a 5 might send a message to a 7; less likely, however, is a 3 messaging a 7; least likely is to message someone less desirable. Thus, the greater your mate value the more motivated you are to pursue someone with an even higher mate value, but not by too much.

Attractiveness of Mates

The *Mate Value Inventory* in Table 2.2 indicates that an attractive face, an attractive body, and health contribute to a person's mate value. What makes a face attractive? One feature is that attractive faces are more symmetrical, which means the right and left half of a face match up. Another feature is sexual dimorphism, which refers to differences in the form or structure between men and women. More attractive male faces show greater masculinity and more attractive female faces show greater femininity. A third feature is that an attractive face represents the average of many facial configurations that occur in the population. It is a face that has average lip, eye, and nose size, for example (Rhodes, 2006). However, the average does not tell the whole story. An attractive female face, compared to the average, has redder lips, darker eye lines, and less mass around the upper neck and cheeks. An attractive male face, compared to the average, has a darker brow, eye lines, and skin and also more beard and less mass around the upper neck and cheeks (Said & Todorov, 2011).

Research on attractiveness can be found at http://www.beautycheck.de/English

Evolutionary Function of Beauty

It is probably safe to state that both women and men prefer attractive partners, who have high mate value. But what is the reason for this preference? One answer is that attractiveness is a universally valued trait that arose during our evolutionary past as a result of sexual selection. This choice is based on the assumption that these traits signal genes for robustness, health, fertility, and intelligence according to the **good genes hypothesis**. In other words, beauty by itself is not important but what beauty signals is. What is the evidence that beauty signals good genes?

Do you have a runny nose, droopy eyes, and appear listless? If so, most people will surmise that you are ill (Axelsson et al., 2018). Perhaps your immune system was not up to the task of defending against pathogens; these are microorganisms (germs) that can cause disease. Thus, one motivation for selecting a mate is to avoid someone who is ill, since their immune system is impaired. Another way, according to the good genes hypothesis, is to select someone with an attractive face, since it should signal that a potential mate has a healthy immune system. The assumption is that any offspring will also have healthy immune systems and thus are more likely to survive. However, research attempts to relate facial attractiveness to a good immune system has failed. In other words, people with more attractive faces did not have stronger immune systems. In addition, attempts to relate facial attractiveness with actual past illnesses has also failed (Cai et al., 2019; Foo et al., 2017; Kalick et al., 1998).

Nevertheless, perhaps, individuals need only be influenced by facial beauty in environments that are known to contain pathogens for various diseases. In those situations, beautiful faces might signal health and greater pathogen resistance. For instance, Ainsworth and Maner (2019) made participants aware of disease by showing them slides about infectious diseases. A control group watched slides about other hazards like "using a hair dryer near a bathtub." Next, the male and female participants were to select the face they most preferred or found most visually appealing from pairs of faces that differed in symmetry. When informed about infectious diseases, women preferred males with more symmetrical faces but did not differ in their preference for female faces. Information about infectious diseases did not affect men's preference for symmetrical faces. Thus, for women, increased awareness of infectious diseases leads to a preference for symmetry, which is a cue for a robust immune system, health, and overall good genes. Similarly, Dixson and co-researchers (2017) tested for the preference of symmetrical faces on three islands in the Southwest Pacific Ocean. The islands varied in the incidence of malaria pathogens. Malaria, transmitted by mosquitos, is a disease characterized by fever, chills, and feeling very sick. Men and women who live on islands with a high incidence of malaria preferred symmetrical faces, while those living on other islands showed no such preference. Again, where infectious diseases are possible, people prefer indicators of health, such as facial symmetry.

Advantages of Beauty

Does an attractive face and body help you acquire a partner? If facial and physical attractiveness determine mate value, then does that increase one's chances of attracting a mate. Rhodes and co-researchers (2005) investigated this question in an Australian sample of men and women. As a measure of success in attracting a mate, the researchers asked the individuals to report their number of sexual partners, age of first intercourse, and the length of each relationship. Photos of the participants were rated for attractiveness, sexual dimorphism,

averageness, and symmetry by a separate group of people. Do these indicators of physical attractiveness correlate with sexual experience? The results showed that they did. Individuals with higher physical mate values had more relationship experiences. Men with attractive faces and attractive and masculine bodies had more sexual partners and also became sexually active at an earlier age. Women with attractive faces became sexually active at an earlier age and had more relationships that exceeded 12 months. The results provide some evidence that as one's mate value increases, the likelihood of attracting others also increases.

Attractiveness for Reproductive Success

Does your attractiveness help determine your reproductive success—that is, how many children you will have? One way to proceed is to rate the attractiveness and sexiness of women's faces when they are young and of an age to enter long-term relationships and then, when the women are older, determine how many children they have. Using this approach, Pflüger and co-researchers (2012) had male university students to rate the photos of 20-year-old women for attractiveness and sexiness on a scale from 1 = *not* to 100 = *highly*. When the women were older, the researchers counted how many children each had. Women rated as being more attractive and sexier experienced more pregnancies and gave birth to more children. This relationship was true only of women who did not use contraception. Other researchers have also found evidence between attractiveness and the number of offspring. Jokela (2009) had people to rate the facial attractiveness of approximately 2,000 men and women from their yearbook photos. Based on these ratings, the faces were divided into four categories of attractiveness: not attractive, moderately attractive, attractive, and very attractive. The level of attractiveness at age 18 predicted how many children a person would have 35–38 years later. Women categorized as attractive had 16% more children than women categorized as not or moderately attractive, while women characterized as very attractive had 6% more children. Only for men in the not-attractive category was there an effect on the number of children. These men had 13% fewer children than the rest. The evolutionary interpretation is that beauty signals the person's mate value for their reproductive capacity.

Universality of Beauty and Health

Facial attractiveness evolved through sexual selection. Consequently, the basis of attractiveness and its relationship to health is assumed to be universal and not culturally specific. This claim is based on research that has resulted in several convincing conclusions (Langlois et al., 2000). First, people agree on who is beautiful and who is not within their culture. Second, people agree on the standards of beauty for faces in cultures other than their own. Third, people agree on the degree of attractiveness among children. Presumably, then, the association between an evolved set of features and physical health or intelligence should be similar everywhere. For example, a runny nose and watery eyes that are linked to a cold would be unattractive compared to the same face when a person does not have a cold. However, there may be instances of cultural standards of beauty that are not linked to health. For example, thinness in women is associated with beauty and health, although extreme thinness is associated with poor health (Weeden & Sabini, 2005).

A Taste for Beauty

Is it possible that a beautiful face or body may not signal anything—that is, it signals neither a good immune system, nor intelligence, nor prospective good health? For instance, have

you experienced a beautiful sunrise/sunset, or beautiful scenery? Their beauty is strictly in the brain of the beholder. No one created these views; they simply exist. Have you experienced seeing a beautiful painting or listened to beautiful music? Again, their beauty is in the brain of the beholder but these entities were created by other individuals. The appreciation of these experiences simply shows our taste for beauty. Does a person choose a mate with a beautiful face because (1) it signals good genes, robustness, and health or because (2) it is simply visually pleasing? In the *Descent of Man* (1871), Darwin wrote that sexual selection could occur on the basis of beauty without beauty signaling other traits. The female animal selected the most beautiful male because he simply charmed her the most. In the evolution of beauty, the standards of beauty that were inherent in the brain of the beholder served as the selecting agent (Prum, 2012, 2017). For example, peahens may simply like many eyespots on the tails of peacocks. Hence, they select mating partners on that basis. Similarly, humans select partners for their facial beauty, symmetry, and averageness. They are motivated to do so because those features are pleasing and appealing. In other words, people like beautiful faces and bodies for no other reason than the pleasure their vision provides.

Value of a Sense of Humor

Do you know any "why did the chicken cross the road?" jokes? A good sense of humor is a psychological characteristic that contributes to mate value. The *Mate Value Inventory* in Table 2.2 indicates that people value it along with other psychological characteristics such as being generous, kind, loyal, and responsible. These are cognitive traits signaling that an individual is genetically fit and intelligent (Klasios, 2013). Does a sense of humor add to mate value? If so, then that trait should correlate with people's sexual experiences or short-term mating success. To test this hypothesis, Greengross and Miller (2011) measured the sense of humor in male and female university students based on their ability to create cartoon captions. Funnier captions indicated a greater sense of humor. Participants also completed a questionnaire that measured their short-term mating success, such as frequency of intercourse and number of sex partners. The results showed that the ability to create humor correlated with short-term mating success. Individuals with a greater sense of humor had more sexual experiences. Thus, in addition to being attractive, it helps to be witty to attract a mate.

Long-Term Mate Selection

Once mates are selected and relationships are formed, then the birth of offspring and parenthood frequently follow. Thus, other aspects of mate value besides physical beauty are important because evolutionary success depends on leaving the most surviving offspring. Furthermore, the biological differences between men and women determine what mate values are important. What are these differences?

Men and women differ in the amount of time they invest in their offspring (Buss, 1989). After sexual intercourse, a woman invests an additional 38 weeks as her baby develops. Thus, at birth, the woman has already invested much more time in the child than the man. In addition, since she cannot produce as many children as a man, it is more important that a woman helps each child to survive; by doing so, she increases her reproductive success. Since a man is capable of having innumerable children, he may not invest as heavily in each individual child as a woman would. He increases his reproductive success by having intercourse with as many women as possible, thereby conceiving many children. Thus, the strategies a