

## CHAPTER 3

# Applying Learning Theories to Healthcare Practice

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### CHAPTER HIGHLIGHTS

- Psychological Learning Theories
  - *Behaviorist Learning Theory*
  - *Cognitive Learning Theory*
  - *Social Learning Theory*
  - *Psychodynamic Learning Theory*
  - *Humanistic Learning Theory*
- Neuropsychology and Learning
- Comparison of Learning Theories
- Motor Learning
  - *Stages of Motor Learning*
  - *Motor Learning Variables*
- Common Principles of Learning
  - *How Does Learning Occur?*
  - *Which Kinds of Experiences Facilitate or Hinder the Learning Process?*
  - *What Helps Ensure That Learning Becomes Relatively Permanent?*
- State of the Evidence

## KEY TERMS

learning	cognitive load	neuropsychology
learning theory	mnemonic devices	plasticity
respondent conditioning	cognitive development	motor learning
association learning	social constructivism	motor performance
classical conditioning	social cognition	cognitive map
Pavlovian conditioning	attribution theory	cognitive plan
systematic desensitization	cognitive-emotional perspective	massed practice
stimulus generalization	emotional intelligence (EI)	distributed practice
discrimination learning	self-regulation	contextual interference effects
spontaneous recovery	role modeling	discovery learning
operant conditioning	vicarious reinforcement	mental practice
escape conditioning	defense mechanisms	intrinsic feedback
avoidance conditioning	resistance	inherent feedback
metacognition	transference	extrinsic feedback
gestalt perspective	hierarchy of needs	augmented feedback
information processing		enhanced feedback

## OBJECTIVES

After completing this chapter, the reader will be able to

1. Define the principal constructs of each learning theory.
2. Differentiate among the basic approaches to learning for each of the five psychological learning theories.
3. Give an example of applying each psychological theory to changing the attitudes and behaviors of learners in a specific situation.
4. Outline alternative strategies for learning in a given situation using at least two different psychological learning theories.
5. Identify the differences and similarities in the psychological learning theories specific to (a) the basic procedures of learning, (b) the assumptions made about the learning, (c) the task of the educator, (d) the sources of motivation, and (e) the way in which the transfer of learning is facilitated.
6. Discuss how neuroscience research has contributed to a better understanding of learning and learning theories.
7. Identify specific teaching strategies for each stage of Fitts and Posner's three stages of motor learning.
8. Explain how different types of practice and feedback variables in motor learning can be applied to patient teaching.

**L**earning is defined in this chapter as a relatively permanent change in mental processing, emotional functioning, skill, and/or behavior as a result of exposure to different experiences. It is the lifelong, dynamic process by which individuals acquire new knowledge or skills and alter their thoughts, feelings, attitudes, and actions.

Learning enables individuals to adapt to demands and changing circumstances and is crucial in health care—whether for patients and families grappling with ways to improve their health and adjust to their medical conditions, for students acquiring the information and skills necessary to become a nurse, or for staff nurses devising more effective approaches to educating

and treating patients and one another in partnership. There are times when what was learned needs to be unlearned. In health care, unlearning is often of special interest, as nurses and others attempt to replace faulty learning and behavior with more accurate information and healthier behavior. Despite the significance of learning to an individual's development, functioning, health, and well-being, debate continues about how learning occurs, which kinds of experiences facilitate or hinder the learning process, and what ensures that learning becomes relatively permanent.

Until the late 19th century, most of the discussions and debates about learning were grounded in philosophy, school administration, and conventional wisdom (Hilgard, 1996). Around the dawn of the 20th century, the new field of educational psychology emerged and became a defining force for the scientific study of learning, teaching, and assessment (Woolfolk, 2012). As a science, educational psychology rests on the systematic gathering of evidence or data to test theories and hypotheses about learning. The more that is discovered about learning through research, the more it is recognized how complex and diverse learning really is.

A **learning theory** is a coherent framework of integrated constructs and principles that describe, explain, or predict how people learn. Psychological learning theories and motor learning are discussed in this chapter, each of which has direct applicability to nursing practice. Rather than offering a single theory of learning, psychology provides alternative theories and perspectives on how learning occurs and what motivates people to learn and change (Hilgard & Bower, 1966; Ormrod, 2014; Snowman & McCown, 2015). Motor learning evolved as a branch of experimental psychology and can be differentiated from “verbal” learning (Newell, 1991). By the middle of the 20th century, motor learning was established as a specialized area of study, and it has been influenced by behavioral theory, cybernetics, and information processing (VanSant, 2003). Psychological learning theories are useful in acquiring information and in situations involving human

thought, emotions, and social interaction. Motor learning is of particular interest to nurses as they try to help their patients and students acquire or relearn skills.

The construction and testing of learning theories over the past century contributed much to the understanding of how individuals acquire knowledge and change their ways of thinking, feeling, and behaving. Reflecting an evidence-based approach to learning, these theoretical explanations may sound reasonable but need to be tested through solid research, then applied and evaluated. The accumulated body of research information can be used to guide the educational process and has challenged many popular notions and myths about learning (e.g., “Spare the rod and spoil the child,” “You can't teach an old dog new tricks,” “The more practice and feedback, the better”). In addition, the major learning theories have wide applicability and form the foundation of not only the field of education but also psychological counseling, workplace organization and human resources management, and marketing and advertising.

Whether used singly or in combination, learning theories have much to offer the practice of health care. Increasingly, health professionals—including nurses—must demonstrate that they regularly employ sound methods and a clear rationale in their education efforts, patient and family interactions, staff management and training, and continuing education and health promotion programs (Ferguson & Day, 2005).

Given the current structure of health care in the United States, nurses, in particular, are often responsible for designing and implementing plans and procedures for improving health education and encouraging wellness. Beyond one's profession, however, knowledge of the learning process relates to nearly every aspect of daily life. Nurses can apply learning theories at the individual, group, and community levels, not only to comprehend and teach new material and tasks but also to solve problems, change unhealthy habits, build constructive relationships, manage emotions, and develop effective behavior.

In this chapter the principal psychological and motor learning theories reviewed and discussed are those that are especially useful to health education and clinical practice. Behaviorist, cognitive, and social learning theories are most often applied to patient education as an aspect of professional nursing practice. It can be argued that emotions and feelings also need explicit focus in relation to learning in general (Goleman, 1995) and to health care in particular (Halpern, 2001). Why? Emotional reactions are often learned as a result of experience, they play a significant role in the learning process, and they are a vital consideration when dealing with health, disease, prevention, wellness, medical treatment, recovery, healing, and relapse prevention. To address this concern, psychodynamic and humanistic perspectives are treated as learning theories because they encourage a patient-centered approach to care and add much to our understanding of human motivation and emotions in the learning process. The review provided here includes motor learning because it offers a framework for nurses teaching motor tasks to patients and students.

The chapter is organized as follows. First, the basic psychological principles of learning for the behaviorist, cognitive, social learning, psychodynamic, and humanistic theories are summarized and illustrated with examples from psychology and healthcare research. With the upsurge of interest in neuroscience research, brief mention is made of some of the contributions of neuropsychology to understanding the dynamics of learning and sorting out the claims of learning theories.

Then, the psychological learning theories are compared with one another on the following aspects:

- The fundamental procedures for changing behavior
- The assumptions made about the learner
- The role of the educator in encouraging learning
- The sources of motivation for learning
- The ways in which learning is transferred to new situations and problems

Next, motor learning theories and variables are reviewed and discussed, including their application for teaching skills to patients and students. Finally, the theories are compared and then synthesized by identifying their common features and addressing three questions: (a) How does learning occur? (b) Which kinds of experiences facilitate or hinder the learning process? and (c) What helps ensure that learning becomes relatively permanent? While surveying this chapter, readers are encouraged to think of ways to apply the learning theories to both their professional and personal lives.

The goals of this chapter are to provide a conceptual framework for subsequent chapters in this text and to offer a toolbox of approaches that nurses can use to enhance learning and change in patients, students, staff, and themselves. Although there is a trend toward integrating learning theories in education, knowledge of each theory's basic principles, advantages, and shortcomings will enable nurses to select, combine, and apply the most useful components of learning theories to specific patients and situations in health care. After completing the chapter, readers should be able to identify the essential principles of learning, describe various ways in which the learning process can be approached, and develop alternative strategies to change the attitudes, behaviors, and skills of learners in different settings.

## ► Psychological Learning Theories

This section summarizes the basic concepts and principles of the behaviorist, cognitive, social learning, psychodynamic, and humanistic learning theories. While reviewing each theory, readers are asked to consider the following questions:

- How do the environment and the internal dynamics of the individual influence learning?
- Is the learner viewed as relatively passive or more active?

- What is the educator's task in the learning process?
- What motivates individuals to learn?
- What encourages the transfer of learning to new situations?
- What are the contributions and criticisms of each learning theory?

## Behaviorist Learning Theory

Focusing mainly on what is directly observable, behaviorists view learning as the product of the stimulus conditions (S) and the responses (R) that follow. Whether dealing with animals or people, the learning process is relatively simple. Generally ignoring what goes on inside the individual—which, of course, is always difficult to ascertain—behaviorists closely observe responses to a situation and then manipulate the environment in some way to bring about the intended change (Kazdin, 2013). Not as popular as it once was, the behaviorist approach is more likely to be used in combination with other learning theories, especially cognitive theory (Dai & Sternberg, 2004; Shanks, 2010). However, behaviorist theory can be particularly useful in nursing practice for the delivery of health care, because patients may not be in a physiological state to want to engage in much thought and reflection. The theory also directly addresses how to break or unlearn bad habits and correct faulty learning.

To modify people's attitudes and responses, behaviorists either alter the stimulus conditions in the environment or change what happens after a response occurs. Motivation is explained as the desire to reduce some drive (drive reduction); hence, satisfied, complacent, or satiated individuals have little motivation to learn and change. Getting behavior to transfer from the initial learning situation to other settings is largely a matter of practice (strengthening habits). Transfer is aided by a similarity in the stimuli and responses in the learning situation and those encountered in future situations where the response is to be performed. Much of behaviorist learning is based on respondent conditioning and operant conditioning procedures.

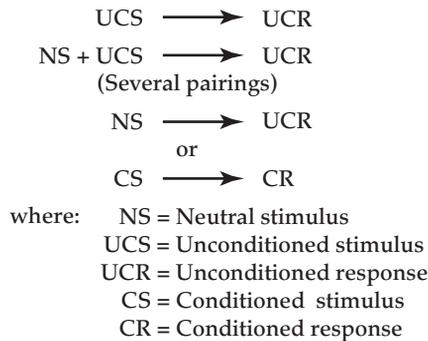
**Respondent conditioning** (also termed **association learning**, **classical conditioning**, or **Pavlovian conditioning**) emphasizes the importance of stimulus conditions and the associations formed in the learning process (Ormrod, 2014). In this basic model of learning, a neutral stimulus (NS)—a stimulus that has no special value or meaning to the learner—is paired with a naturally occurring unconditioned or unlearned stimulus (UCS) and unconditioned response (UCR) (**FIGURE 3-1**). After a few such pairings, the neutral stimulus alone (i.e., without the unconditioned stimulus) elicits the same unconditioned response. Thus, learning takes place when the newly conditioned stimulus (CS) becomes associated with the conditioned response (CR)—a process that may well occur without conscious thought or awareness.

Consider an example from health care. Someone without much experience with hospitals (NS) may visit a relative who is ill. While in the relative's room, the visitor may smell of-fensive odors (UCS) and feel queasy and light-headed (UCR). After this initial visit and later repeated visits, hospitals (now the CS) may become associated with feeling anxious and nauseated (CR), especially if the visitor smells similar odors to those encountered during the first experience (see Figure 3-1).

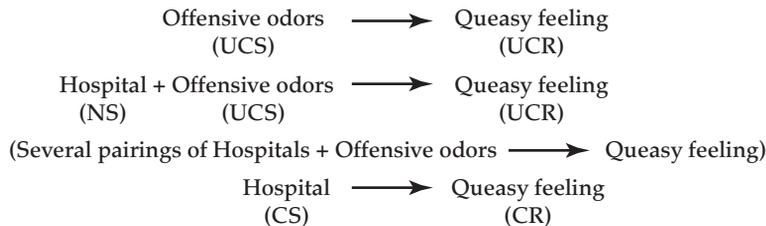
In health care, respondent conditioning highlights the importance of a healthcare facility's environment and culture as it may affect patients, staff, and visitors. For example, often without thinking or reflection, patients and visitors formulate associations about health care based on their hospital experiences, providing the basis for long-lasting attitudes toward medicine, healthcare facilities, and health professionals.

In addition to influencing the acquisition of new responses to environmental stimuli, principles of respondent conditioning may be used to extinguish, or unlearn, a previously learned response. Responses decrease if the presentation of the conditioned stimulus is not accompanied by the unconditioned stimulus over time. Thus, if the visitor who became dizzy in one hospital subsequently goes to other hospitals to see

## BASIC MODEL OF LEARNING



## EXAMPLE



**FIGURE 3-1** Respondent conditioning model of learning.

relatives or friends without smelling offensive odors, then her discomfort and anxiety about hospitals may lessen after several such experiences.

**Systematic desensitization** is a technique based on respondent conditioning that is used by psychologists to reduce fear and anxiety in their clients (Wolpe, 1982). The assumption is that fear of a certain stimulus or situation is learned; therefore, it also can be unlearned or extinguished. Because a person cannot be both anxious and relaxed at the same time, fearful individuals are first taught relaxation techniques. While they are in a state of relaxation, the fear-producing stimulus is gradually introduced at a nonthreatening level so that anxiety and emotions are not aroused. After repeated pairings of the stimulus under relaxed, nonfrightening conditions, the individual learns that no harm will come to him from the once fear-inducing

stimulus. Finally, the client is able to confront the stimulus without being anxious and afraid.

In healthcare research, respondent conditioning has been used to extinguish chemotherapy patients' anticipatory nausea and vomiting (Lotfi-Jam et al., 2008; Stockhurst, Steingrueber, Enck, & Klosterhalfen, 2006). Systematic desensitization has been used to treat drug addiction (Piane, 2000), phobias (McCullough & Andrews, 2001), and tension headaches (Deyl & Kaliappan, 1997) and to teach children with attention-deficit/hyperactivity disorder (ADHD) or autism to swallow pills (Beck, Cataldo, Slifer, Pulbrook, & Guhman, 2005). As another illustration, prescription drug advertisers regularly employ conditioning principles to encourage consumers to associate a brand-name medication with happy and improved lifestyles. Once conditioned, consumers will likely favor the

advertised drug over competitors' medications and the much less expensive generic form. As a third example, taking the time to help patients relax and reduce their stress when applying some medical intervention—even a painful procedure—lessens the likelihood that patients will build up negative and anxious associations about medicine and health care.

Certain respondent conditioning concepts are especially useful in the healthcare setting. **Stimulus generalization** is the tendency of initial learning experiences to be easily applied to other similar stimuli. For example, when listening to friends and relatives describe a hospital experience, it becomes apparent that a highly positive or negative personal encounter may color patients' evaluations of their hospital stays as well as their subsequent feelings about having to be hospitalized again. With more and varied experiences, individuals learn to differentiate among similar stimuli, at which point **discrimination learning** is said to have occurred. As an illustration, patients who have been hospitalized a number of times often have learned a lot about hospitalization. As a result of their experiences, they make sophisticated distinctions and can discriminate among stimuli (e.g., what the various noises mean and what the various health professionals do), which novice patients cannot. Much of professional education and clinical practice involves moving from being able to make generalizations to discrimination learning.

**Spontaneous recovery** is a useful respondent conditioning concept that needs to be given careful consideration in relapse prevention programs. The underlying principle operates as follows: Although a response may appear to be extinguished, it may recover and reappear at any time (even years later), especially when stimulus conditions are similar to those in the initial learning experience. Spontaneous recovery helps us understand why it is so difficult to eliminate completely unhealthy habits and addictive behaviors such as smoking, alcoholism, and drug abuse. As this principle demonstrates, it is much easier to learn a behavior than to unlearn it.

Another widely recognized approach to learning is **operant conditioning**, which was developed largely by B. F. Skinner (1974, 1989). Operant conditioning focuses on the behavior of the organism and the reinforcement that occurs after the response. A reinforcer is a stimulus or event applied after a response that strengthens the probability that the response will be performed again. When specific responses are reinforced on the proper schedule, behaviors can be either increased or decreased (Prichard, 2014).

**BOX 3-1** summarizes the principal ways to increase and decrease responses by applying the contingencies of operant conditioning. Understanding the dynamics of learning presented in

### BOX 3-1 Operant Conditioning Model: Contingencies to Increase and Decrease the Probability of an Organism's Response

To *increase* the probability of a response:

- A. *Positive reinforcement*: application of a pleasant stimulus  
*Reward conditioning*: a pleasant stimulus is applied following an organism's response
- B. *Negative reinforcement*: removal of an aversive or unpleasant stimulus  
*Escape conditioning*: as an aversive stimulus is applied, the organism makes a response that causes the unpleasant stimulus to cease  
*Avoidance conditioning*: an aversive stimulus is anticipated by the organism, which makes a response to avoid the unpleasant event

To *decrease* or *extinguish* the probability of a response:

- A. *Nonreinforcement*: an organism's conditioned response is not followed by any kind of reinforcement (positive, negative, or punishment)
- B. *Punishment*: following a response, an aversive stimulus is applied that the organism cannot escape or avoid

this box can prove useful to nurses in assessing and identifying ways to change individuals' behaviors in the healthcare setting. The key is to carefully observe individuals' responses to specific stimuli and then select the best reinforcement procedures to change a behavior.

Two methods to *increase* the probability of a response are to apply positive or negative reinforcement after a response occurs. According to Skinner (1974), giving positive reinforcement (i.e., reward) greatly enhances the likelihood that a response will be repeated in similar circumstances. As an illustration, although a patient moans and groans as he attempts to get up and walk for the first time after an operation, praise and encouragement (reward) for his efforts at walking (response) will improve the chances that he will continue struggling toward independence.

A second way to increase a behavior is by applying negative reinforcement after a response is made. This form of reinforcement involves the removal of an unpleasant stimulus through either escape conditioning or avoidance conditioning. The difference between the two types of negative reinforcement relates to timing.

In **escape conditioning**, as an unpleasant stimulus is being applied, the individual responds in some way that causes the uncomfortable stimulation to cease. Suppose, for example, that when a member of the healthcare team is being chastised in front of the group for being late and missing meetings, she says something humorous. The head of the team stops criticizing her and laughs. Because the use of humor has allowed the team member to escape an unpleasant situation, chances are that she will employ humor again to alleviate a stressful encounter and thereby deflect attention from her problem behavior.

In **avoidance conditioning**, the unpleasant stimulus is anticipated rather than being applied directly. Avoidance conditioning has been used to explain some people's tendency to become ill to avoid doing something they do not want to do. For example, a child fearing a teacher or test may tell his mother that he has a stomachache.

If allowed to stay home from school, the child increasingly may complain of sickness to avoid unpleasant situations. Thus, when fearful events are anticipated, sickness, in this case, is the behavior that has been increased through negative reinforcement.

According to operant conditioning principles, behaviors also may be *decreased* through either nonreinforcement or punishment. Skinner (1974) maintained that the simplest way to extinguish a response is not to provide any kind of reinforcement for some action. For example, offensive jokes in the workplace may be handled by showing no reaction; after several such experiences, the joke teller, who more than likely wants attention—and negative attention is preferable to no attention—may curtail his or her use of offensive humor. Keep in mind, too, that desirable behavior that is ignored may lessen as well if its reinforcement is withheld.

If nonreinforcement proves ineffective, then punishment may be employed as a way to decrease responses, although this approach carries many risks. Under punishment conditions, the individual cannot escape or avoid an unpleasant stimulus. Suppose, for example, a nursing student is continually late for class and noisily disrupts the class when she finally arrives, annoying both other students and the instructor. The instructor discovers there is no valid reason for the student's lateness—the student says she overslept and did not allow sufficient time to find a parking place and cites other factors she should have more control over. The instructor tries praising the student the few times she comes to class on time (positive reinforcement) and tries not paying attention to her when she arrives late (nonreinforcement), but the student continues to be late to class more often than she is on time. The student appears to enjoy the attention she receives. As a last resort, the instructor may try punishment, which involves applying a negative reinforcer and removing a positive reinforcer. The positive reinforcers to be removed are the attention the student receives and the fact that she does not really need to change her behavior to conform to classroom

expectations. The instructor might tell the student that if she is late, she must come in the back door and sit at the back of the class, making sure not to disturb anyone (removal of the positive reinforcer of attention). Each time the student is late, the instructor will make note in her grade book (negative reinforcer of not doing well in the course).

The problem with using punishment as a technique for teaching is that the learner may become highly emotional and may well divert attention away from the behavior that needs to be changed. Some people who are being punished become so emotional (sad or angry) that they do not remember the behavior for which they are being punished. One of the cardinal rules of operant conditioning is to “punish the behavior, not the person.” In the preceding example, the instructor must make it clear that she is punishing the student for being late and disrupting class rather than convey that she does not like the student.

If punishment is employed, it should be administered immediately after the response with no distractions or means of escape. Punishment also must be consistent and at the highest reasonable level (e.g., nurses who apologize and smile as they admonish the behavior of a staff member or patient are sending mixed messages and are not likely to be taken seriously or to decrease the behavior they intend). Moreover, punishment should not be prolonged (bringing up old grievances or complaining about a misbehavior at every opportunity), but there should be a time-out following punishment to eliminate the opportunity for positive reinforcement. The purpose of punishment is not to do harm or to serve as a release for anger; rather, the goal is to decrease a specific behavior and to instill self-discipline.

Operant conditioning and discussions of punishment were more popular during the mid-20th century than they are currently. However, it is important for nurses to be aware of the many cautions about punishment because punishment continues to be used more than it should in the healthcare setting and all too often in damaging ways.

The use of reinforcement is central to the success of operant conditioning procedures. For operant conditioning to be effective, it is necessary to assess which kinds of reinforcement are likely to increase or decrease behaviors in an individual. Not every patient, for example, finds health practitioners’ terms of endearment rewarding. Comments such as “Very nice job, dear,” may be presumptuous or offensive to some clients. A second issue involves the timing of reinforcement. Through experimentation with animals and humans, researchers have demonstrated that the success of operant conditioning procedures partially depends on the schedule of reinforcement. Initial learning requires a continuous schedule, reinforcing the behavior quickly every time it occurs. If the desired behavior does not occur, then responses that approximate or resemble it can be reinforced, gradually shaping behavior in the direction of the goal for learning. As an illustration, for geriatric patients who appear lethargic and unresponsive, nurses might begin by rewarding small gestures such as eye contact or a hand that reaches out and then build on these friendly behaviors toward greater human contact and connection with reality. Once a response is well established, however, it becomes ineffective and inefficient to continually reinforce the behavior. Reinforcement then can be administered on a fixed (predictable) or variable (unpredictable) schedule after a given number of responses have been emitted or after the passage of time.

Operant conditioning techniques provide relatively quick and effective ways to change behavior. Carefully planned programs using behavior modification procedures can readily be applied to health care. For example, computerized instruction and tutorials for patients and staff rely heavily on operant conditioning principles in structuring learning programs. In the clinical setting, the families of patients with chronic back pain have been taught to minimize their attention to the patients whenever they complain and behave in dependent, helpless ways, but to pay a lot of attention when the patients attempt to function independently, express a positive

attitude, and try to live as normal a life as possible. Some patients respond so well to operant conditioning that they report experiencing less pain as they become more active and involved. A systematic review of physiotherapist-provided operant conditioning (POC) found moderate evidence showing that POC is more effective than a placebo intervention in reducing short-term pain in patients with subacute low back pain (Bunzli, Gillham, & Esterman, 2011). Operant conditioning and behavior modification techniques also have been found to work well with some nursing home and long-term care residents, especially those who are losing their cognitive skills (Proctor, Burns, Powell, & Tarrier, 1999; Spira & Edelstein, 2007).

The behaviorist theory is simple and easy to use, and it encourages clear, objective analysis of observable environmental stimulus conditions, learner responses, and the effects of reinforcements on people's actions. There are, however, some criticisms and cautions to consider when relying on this theory. First, behaviorist theory is a teacher-centered model in which learners are assumed to be relatively passive and easily manipulated, which raises a crucial ethical question: Who is to decide what the desirable behavior should be? Too often the desired response is conformity and cooperation to make someone's job easier or more profitable. Second, the theory's emphasis on extrinsic rewards and external incentives reinforces and promotes materialism rather than self-initiative, a love of learning, and intrinsic satisfaction. Third, research evidence supporting behaviorist theory is often based on animal studies, the results of which may not be applicable to human behavior. A fourth shortcoming of behavior modification programs is that learners' changed behavior may deteriorate over time, especially once they return to their former environment—an environment with a system of rewards and punishments that may have fostered their problems in the first place.

The next section moves from focusing on responses and behavior to considering the role of mental processes in learning.

## Cognitive Learning Theory

Whereas behaviorists generally ignore the internal dynamics of learning, cognitive learning theorists stress the importance of what goes on inside the learner. Cognitive theory is composed of subtheories and is widely used in education and counseling. According to this perspective, the key to learning and changing is the individual's cognition (perception, thought, memory, and ways of processing and structuring information). Cognitive learning is viewed as a highly active process largely directed by the individual. It involves perceiving the information, interpreting it based on what is already known, and then reorganizing the information into new insights or understanding (Matlin, 2013; Sternberg & Sternberg, 2017).

Unlike behaviorists, cognitive theorists maintain that reward is not necessary for learning to take place. More important are learners' goals and expectations, which create disequilibrium, imbalance, and tension that motivate learners to act. Educators trying to influence the learning process must recognize the variety of past experiences, perceptions, ways of incorporating and thinking about information. They also need to consider the diverse aspirations, expectations, and social influences that affect any learning situation. Also influencing the process of learning is the learner's **metacognition**, or her understanding of her way of learning. To promote transfer of learning, the learner must mediate or act on the information in some way. Similar patterns in the initial learning situation and subsequent situations facilitate this transfer.

Cognitive learning theory includes several well-known perspectives, such as gestalt, information processing, human development, social constructivism, and social cognition theory. More recently, attempts have been made to incorporate considerations related to emotions within cognitive theory. Each of these perspectives emphasizes a particular feature of cognition. When pieced together, they indicate much about what goes on inside the learner. As the various cognitive perspectives

are briefly summarized here, readers are encouraged to imagine their potential applications in the healthcare setting. In keeping with cognitive principles of learning, being mentally active when processing information encourages its retention in long-term memory.

One of the oldest psychological theories is the **gestalt perspective**, which emphasizes the importance of perception in learning and lays the groundwork for various other cognitive perspectives that followed (Hilgard & Bower, 1966; Murray, 1995). Rather than focusing on discrete stimuli, gestalt refers to the configuration or patterned organization of cognitive elements, reflecting the maxim that “the whole is greater than the sum of its parts.” A principal assumption is that each person perceives, interprets, and responds to any situation in his or her own way. Although many gestalt principles are worth knowing, the discussion here focuses on those that are particularly useful to health care.

A basic gestalt principle is that psychological organization is directed toward simplicity, equilibrium, and regularity. For example, study the bewildered faces of some patients listening to a complex, detailed explanation about their disease; instead what they desire most is a simple, clear explanation that settles their uncertainty and relates directly to them and their familiar experiences.

Another central gestalt principle with several ramifications is that perception is selective. First, because no one can attend to all possible surrounding stimuli at any given time, individuals attend (orient) to certain features of an experience while screening out or ignoring (habituating to) other features. Patients who are in severe pain or who are worried about their hospital bills, for example, may not attend to well-intentioned patient education information. Second, what individuals pay attention to and what they ignore are influenced by a host of factors: past experiences, needs, personal motives and attitudes, reference groups, and the actual structure of the stimulus or situation (Sherif & Sherif, 1969). Assessing these internal and external dynamics has a direct bearing on how a health educator approaches any learning

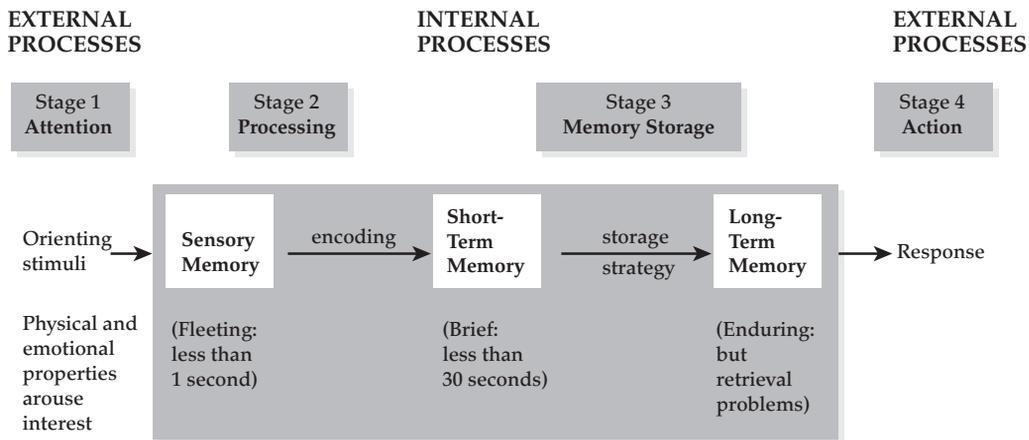
situation with an individual or group. Moreover, because individuals vary widely regarding these and other characteristics, they will perceive, interpret, and respond to the same event in different ways, perhaps distorting reality to fit their goals and expectations. This tendency helps explain why an approach that is effective with one client may not work with another client. People with chronic illnesses—even different people with the same illness—are not alike, and helping any patient with disease or disability includes recognizing each person’s unique perceptions and subjective experiences (Imes, Clance, Gailis, & Atkeson, 2002). Also, some interesting applications of gestalt theory can lead to changing addictive behaviors (Brownell, 2012).

**Information processing** is a cognitive perspective that emphasizes thinking processes: thought, reasoning, the way information is encountered and stored, and memory functioning (Gagné, 1985; Sternberg & Sternberg, 2017). How information is incorporated and retrieved is useful for nurses to know, especially in relation to learning by older adults (Park, Morrell, & Shifren, 2014).

**FIGURE 3-2** illustrates an information-processing model of memory functioning. Tracking learning through the various stages of this model is helpful in assessing what happens to information as each learner perceives, interprets, and remembers it. Undertaking this analysis may suggest ways to improve the structure of the learning situation as well as ways to correct misconceptions, distortions, and errors in learning.

The first stage in the memory process involves paying attention to environmental stimuli; attention, then, is the key to learning. Thus, if a patient is not attending to what a nurse educator is saying, perhaps because the patient is weary or distracted, it would be prudent for the educator to try the explanation at another time when the individual is more receptive and attentive.

In the second stage, the information is processed by the senses. Here it becomes important to consider the client’s preferred mode of sensory processing (visual, auditory, or motor



**FIGURE 3-2** Information-processing model of memory.

manipulation) and to ascertain whether he or she has any sensory deficits. For a variety of reasons, presenting material using multiple sensory modes aids learning as well (Collins, 2016).

In the third stage of the memory process, the information is transformed and incorporated (encoded) briefly into short-term memory, after which it suffers one of two fates: The information is disregarded and forgotten, or it is stored in long-term memory. Long-term memory involves the organization of information by using a preferred strategy for storage (e.g., imagery, association, rehearsal, or breaking the information into units). Although long-term memories are enduring, a central problem is retrieving the stored information in the future.

The last stage in the memory-processing model involves the action or response that the individual undertakes based on how information was processed and stored. Education requires assessing how a learner attends to, processes, and stores the information that is presented as well as finding ways to encourage the retention and retrieval processes. Errors are corrected by helping learners reprocess what needs to be learned (Kessels, 2003).

In general, cognitive psychologists note that memory processing and the retrieval of information are enhanced by organizing that

information and making it meaningful. A useful, descriptive model has been provided by Robert Gagné (1985). Subsequently, Gagné and his colleagues outlined nine events and their corresponding cognitive processes that activate effective learning (Gagné, Briggs, & Wagner, 1992):

- Gain the learner's attention (reception)
- Inform the learner of the objectives and expectations (expectancy)
- Stimulate the learner's recall of prior learning (retrieval)
- Present information (selective perception)
- Provide guidance to facilitate the learner's understanding (semantic encoding)
- Have the learner demonstrate the information or skill (responding)
- Give feedback to the learner (reinforcement)
- Assess the learner's performance (retrieval)
- Work to enhance retention and transfer through application and varied practice (generalization)

In employing this model, teachers must carefully analyze the requirements of the activity, design and sequence the instructional events, and select appropriate media to achieve the outcomes. Other similar cognitive models for learning exist (Prichard, 2014). Nurses familiar with cognitive theory may want to design their own

cognitive models and assess how well they work with patients, staff, and students.

Within the information-processing perspective, Sternberg (1996) reminds educators to consider styles of thinking, which he defines as “a preference for using abilities in certain ways” (p. 347). In education, the instructor’s task is to get in touch with the learner’s way of processing information and thinking. Differences in learning styles is one reason an educational theory or model may not work for everyone. (See the review of learning styles in Chapter 4.) Some implications for health care include the need to carefully match jobs with styles of thinking, to recognize that people may shift from preferring one style of thinking to another, and, most important, to appreciate and respect the different styles of thinking reflected among the many players in the healthcare setting. Yet striving for a match in styles is not always necessary or desirable. Tennant (2006) notes that adult learners may actually benefit from grappling with views and styles of learning unlike their own, which may promote maturity, creativity, and a greater tolerance for differences. Because nurses are expected to instruct a variety of people with diverse styles of learning, Tennant’s suggestion has interesting implications for nursing education programs.

The information-processing perspective is particularly helpful for assessing problems in acquiring, remembering, and recalling information. Some strategies include the following:

1. Have learners indicate how they believe they learn (metacognition)
2. Ask them to describe what they are thinking as they are learning
3. Evaluate learners’ mistakes
4. Give close attention to learners’ inability to remember or demonstrate information

For example, forgetting or having difficulty in retrieving information from long-term memory is a major stumbling block in learning. This problem may occur at the input end, such as a failure to pace the amount of information (**cognitive load**) and/or the timing of the presentation

of information (Sweller, Ayers, & Kalyuga, 2011). To aid learning at the input stage, some suggestions are to break the material into small parts or chunks, use memory tricks and techniques (**mnemonic devices**), relate the new material to something familiar, and put it into context for learners (Collins, 2016). At the output end, it may be a retrieval problem. For example, the information has faded from lack of use, other information interferes with its retrieval (what comes before or after a learning session may well confound storage and retrieval), or individuals are motivated to forget for a variety of conscious and unconscious reasons.

This material on memory processing and functioning is highly pertinent to healthcare practice—whether in developing health education brochures, engaging in one-to-one patient education, delivering a staff development workshop, preparing community health lectures, or helping students to study for courses and examinations. Focusing on attention, storage, and memory is essential in the education of older adult patients, including the identification of fatigue, medications, and anxieties that may interfere with learning and remembering (Park et al., 2014). A common issue with older adults is they may recognize they should know the information, but they have trouble recalling names, dates, and other specifics. And, for everyone, the issue of competence versus performance is always a factor: although learners may truly know information or a skill (competence), they fail to produce it at a specific moment (performance).

Heavily influenced by gestalt psychology, **cognitive development** is a third perspective on learning that focuses on qualitative changes in perceiving, thinking, and reasoning as individuals grow and mature (Crandell, Crandell, & Vander Zanden, 2012; Newman & Newman, 2015). Cognitions are based on how external events are conceptualized, organized, and represented within each person’s mental framework or schema, which is partially dependent on the individual’s stage of development in perception, reasoning, and readiness to learn. In other words, age and stage of life can affect learning.

Much of the theory and research in this area has been concerned with identifying the characteristics and advances in the thought processes of children and adolescents. A principal assumption is that learning is a developmental, sequential, and active process that transpires as the child interacts with the environment, makes discoveries about how the world operates, and interprets these discoveries in keeping with what she knows (schema).

Jean Piaget is the best known of the cognitive developmental theorists. His observations of children's perceptions and thought processes at different ages have contributed much to our recognition of the unique, changing abilities of youngsters to reason, conceptualize, communicate, and perform (Piaget & Inhelder, 1969). By watching, asking questions, and listening to children, Piaget identified and described four sequential stages of cognitive development: sensorimotor, preoperational, concrete operations, and formal operations. These stages become evident over the course of infancy, early childhood, middle childhood, and adolescence, respectively. According to Piaget's theory of cognitive learning, children take in or incorporate information as they interact with people and the environment. They either make their experiences fit with what they already know (assimilation) or change their perceptions and interpretations in keeping with the new information (accommodation). Nurses and family members need to determine what children are perceiving and thinking in a particular situation. As an illustration, young children usually do not comprehend fully that death is final. They respond to the death of a loved one in their own way, perhaps asking God to give back the dead person or believing that if they act like a good person, the deceased loved one will return to them (Gardner, 1978).

Proponents of the cognitive development perspective manifest some differences in their views that are worth considering by nurse educators. For example, although Piaget stresses the importance of perception in learning and views children as little scientists exploring, interacting, and discovering the world in a relative

solitary manner, Russian psychologist Lev Vygotsky (1986) emphasizes the significance of language, social interaction, and adult guidance in the learning process. When teaching children, the job of adults is to interpret, respond, and give meaning to children's actions. Rather than the discovery method favored by Piaget, Vygotsky advocates clear, well-designed instruction that is carefully structured to advance each person's thinking and learning.

In practice, some children may learn more effectively by discovering and putting pieces together on their own, whereas other children benefit from a more social and directive approach. It is the health educator's responsibility to identify the child's or teenager's stage of thinking, to provide experiences at an appropriate level for the child to actively discover and participate in the learning process, and to determine whether a child learns best through language and social interaction or through perceiving and experimenting in his or her own way. Research suggests that young children's learning is often more solitary, whereas older children may learn more readily through social interaction (Palincsar, 1998).

What do cognitive developmental theorists say about adult learning? First, although the cognitive stages develop sequentially, some adults never reach the formal operations stage. These adults may learn better from explicitly concrete approaches to health education. Second, developmental psychologists and gerontologists have proposed advanced stages of reasoning in adulthood that go beyond formal operations. For example, it is not until the adult years that people become better able to deal with contradictions, synthesize information, and more effectively integrate what they have learned—characteristics that differentiate adult thought from adolescent thinking (Kramer, 1983). Third, older adults may demonstrate an advanced level of reasoning derived from their wisdom and life experiences, or they may reflect lower stages of thinking resulting from lack of education, disease, depression, extraordinary stress, or medications (Hooyman, Kawamoto, & Kiyak, 2015).

Research indicates that adults generally do better when offered opportunities for self-directed learning (emphasizing learner control, autonomy, and initiative), and they have an explicit rationale for learning. They also may do better with a problem-oriented rather than subject-oriented approach and when they have opportunities to use their experiences and skills to help others (Tennant, 2006). Educators must keep in mind too that anxiety, the demands of adult life, and past childhood experiences may interfere with learning in adulthood.

Cognitive theory has been criticized for neglecting the social context. To counteract this omission, the effects of social factors on perception, thought, and motivation require attention. **Social constructivism** and **social cognition** are two increasingly popular perspectives within cognitive theory that take the social milieu into account.

Drawing heavily from gestalt psychology and developmental psychology, social constructivists take issue with some of the highly rational assumptions of the information-processing view and build on the work of John Dewey, Jean Piaget, and Lev Vygotsky (Palincsar, 1998). These theorists posit that individuals formulate or construct their own versions of reality and that learning and human development are richly colored by the social and cultural context in which people find themselves. A central tenet of the social constructivist approach is that ethnicity, social class, gender, family life, life history, self-concept, and the learning situation itself all influence an individual's perceptions, thoughts, emotions, interpretations, and responses to information and experiences. A second principle is that effective learning occurs through social interaction, collaboration, and negotiation (Shapiro, 2002).

According to this view, the players in any healthcare setting may have differing perspectives on external reality, including distorted perceptions and interpretations. Every person operates on his or her own unique representations and interpretations of a situation, all of which have been heavily influenced by that individual's social and cultural experiences. The impact of culture

cannot be ignored, and learning is facilitated by sharing beliefs, by acknowledging and challenging differing conceptions, and by negotiating new levels of conceptual understanding (Marshall, 1998). Cooperative learning and self-help groups are examples of social constructivism in action. Given the rapidly changing age and ethnic composition in the United States, the social constructivist perspective has much to contribute to health education and health promotion efforts.

Rooted in social psychology, the social cognition perspective reflects a constructivist orientation and highlights the influence of social factors on perception, thought, and motivation. A host of scattered explanations can be found under the rubric of social cognition (Carlston, 2013; Fiske & Taylor, 2013), which, when applied to learning, emphasize the need for instructors to consider the dynamics of the social environment and groups on both interpersonal and intrapersonal behavior. As an illustration, **attribution theory** focuses on the cause-and-effect relationships and explanations that individuals formulate to account for their own and others' behavior and the way in which the world operates. Many of these explanations are unique to the individual and tend to be strongly colored by cultural values and beliefs. For example, patients with certain religious views or a type of parental upbringing may believe that their disease is a punishment for their sins (internalizing blame); other patients may attribute their disease to the actions of others (externalizing blame). From this perspective, patients' attributions may or may not promote wellness and well-being. The route to changing health behaviors is to change distorted attributions. Nurses' prejudices, biases (positive and negative), and attributions need to be considered as well in the healing process.

Cognitive theory has been criticized for neglecting emotions, and efforts have been made to incorporate considerations related to emotions within a cognitive framework, an approach known as the **cognitive-emotional perspective**. As Eccles and Wigfield (2002) comment, "Cold" cognitive models cannot adequately

capture conceptual change; there is a need to consider affect as well” (p. 127).

Several slightly different cognitive orientations to emotions have been proposed and are briefly summarized here:

- Empathy and the moral emotions (e.g., guilt, shame, distress, moral outrage) play a significant role in influencing children’s moral development and in motivating people’s prosocial behavior, activism, and ethical responses (Braungart & Braungart, 2006; Hoffman, 2000).
- Memory storage and retrieval, as well as moral decision making, involve both cognitive and emotional brain processing, especially in response to situations that directly involve the self and are stressful (Collins, 2016; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001).
- **Emotional intelligence (EI)** entails an individual managing his emotions, motivating himself, reading the emotions of others, and working effectively in interpersonal relationships. Some argue EI is more important to leadership, social judgment, and moral behavior than cognitive intelligence is (Goleman, 1995; Mayer, Roberts, & Barsade, 2008).
- **Self-regulation** includes learners monitoring their own cognitive processes, emotions, and surroundings to achieve goals. The ability to self-regulate has been found to be a key factor in learning and studying (Bjork, Dunlosky, & Kornell, 2013) and for successful living and effective social behavior (Baumeister & Vohs, 2007).

The implications are that nursing and other health professional education programs would do well to exhibit and encourage empathy and EI in working with patients, family, and staff and to attend to the dynamics of self-regulation as an approach to promoting positive personal growth and effective leadership. Research indicates that the development of these attributes in self and patients is associated with a greater likelihood of healthy behavior, psychological

well-being, optimism, and meaningful social interactions (Brackett, Lopes, Ivcevic, Mayer, & Salovey, 2004). EI has been applied to reducing stress and violence in the healthcare workplace (Littlejohn, 2012) and used as a predictor of professional satisfaction and well-being (Zeidner & Hadar, 2014).

A significant benefit of the cognitive theory to health care is the recognition of individuality and diversity in how people learn and process experiences. When applied to health care, cognitive theory has proved useful in formulating exercise programs for breast cancer patients (Rogers et al., 2004), understanding individual differences in bereavement (Stroebe, Folkman, Hansson, & Schut, 2006), and dealing with adolescent depression in girls (Papadakis, Prince, Jones, & Strauman, 2006). This theory highlights the wide variation in how learners actively structure their perceptions; confront a learning situation; encode, process, store, and retrieve information; and manage their emotions—all of which are influenced by social and cultural forces. The challenge for educators is to identify each learner’s level of cognitive development and the social factors that affect learning. This information then is used to find ways to foster insight, creativity, and problem solving.

Difficulties may arise in ascertaining exactly what is transpiring inside the mind of each individual and in designing learning activities that encourage people to restructure their perceptions, reorganize their thinking, regulate their emotions, change their attributions and behavior, and create workable solutions. This is no small challenge. Research indicates people often have a “faulty mental model of how they learn and remember.” Another factor to consider is how society contributes assumptions and attitudes that “can be counterproductive in individuals becoming maximally effective learners” (Bjork et al., 2013, p. 417). Teaching people to learn how to learn and to monitor and regulate their own learning is now considered part of the educator’s job.

The next learning theory combines principles from both the behaviorist and cognitive theories.

## Social Learning Theory

Social learning theory is largely based on the work of Albert Bandura (1977, 2001), who mapped out a perspective on learning that includes consideration of the personal characteristics of the learner, behavior patterns, and the environment. Since its inception, this theory has gone through several “paradigm shifts” (Bandura, 2001, p. 2). In early formulations, Bandura emphasized behaviorist features and the imitation of role models; later, his focus shifted to cognitive considerations, such as the attributes of the self and the internal processing of the learner. Bandura’s attention then turned to the impact of social factors and the social context within which learning and behavior occur. As Bandura’s model of social learning has evolved, the learner is now viewed as central (what Bandura calls a “human agency”), which suggests the need to identify what learners are perceiving and how they are interpreting and responding to social situations. As such, careful consideration needs to be given to the healthcare environment as a social situation.

One of Bandura’s early observations was that individuals do not need to have direct experiences to learn. Considerable learning occurs by taking note of other people’s behavior and what happens to them. Thus, learning is often a social process, and other individuals, especially significant others, provide compelling examples or role models for how to think, feel, and act.

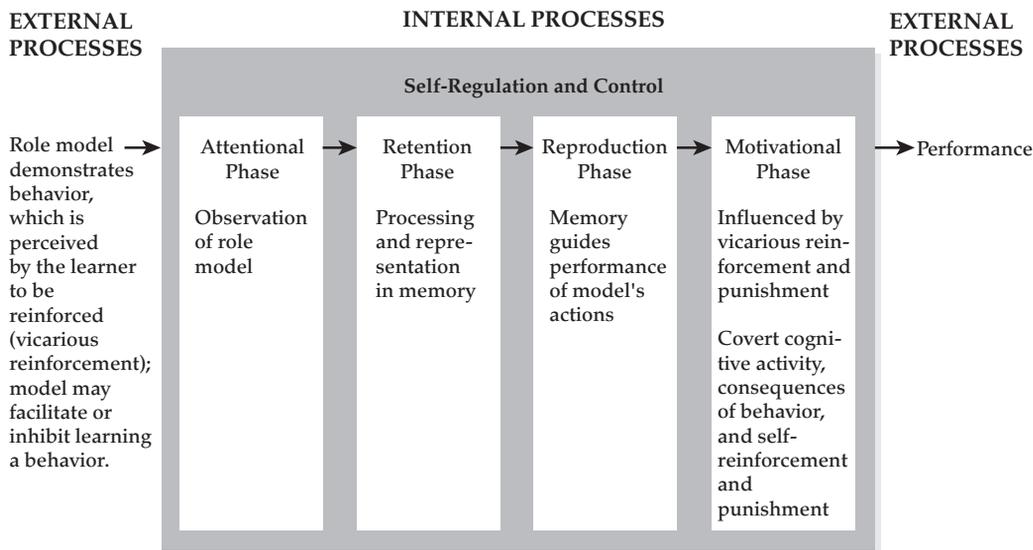
**Role modeling**, therefore, is a central concept of social learning theory. As an example, a more experienced nurse who demonstrates desirable professional attitudes and behaviors sometimes serves as a mentor for a less experienced colleague. Armstrong (2008) emphasizes that to facilitate learning, role models need to be enthusiastic, professionally organized, caring, and self-confident, as well as knowledgeable, skilled, and good communicators. Research indicates that nurse managers’ attitudes and actions—ensuring safety, integrating knowledge with practice, sharing feelings, challenging staff nurses and students, and demonstrating competence and

willingness to provide guidance to others—influence the outcomes of the clinical supervision process (Berggren & Severinsson, 2006). How nurse mentors perceive their role is an important consideration in the leadership selection process (Coombs-Ephraim, 2016; Neary, 2000).

**Vicarious reinforcement**, another concept from social learning theory, involves determining whether role models are perceived as rewarded or punished for their behavior. Reward is not always necessary, however, and a learner may imitate the behavior of a role model even when no reward is available to either the role model or the learner. Nevertheless, in many cases, whether the model is viewed by the observer as rewarded or punished may have a direct influence on learning. This relationship may be one reason why it is difficult to attract health professionals to geriatric care. Although some highly impressive role models work in this field, geriatric health care is often accorded lower status with less pay in comparison to other specialty areas.

Subsequently, Bandura (1977) included cognitive principles in his social learning theory, stressing the self-regulation and control that the individual exerts in the process of acquiring knowledge and changing behavior. He outlined a four-step, largely internal process that directs social learning (**FIGURE 3-3**). Although some of this model’s components are similar to the information-processing model described previously, a principal difference is the inclusion of a motivational component in the social learning theory model.

The first step in Bandura’s model is the attentional phase, a necessary condition for any learning to occur. Research indicates that role models with high status and competence are more likely to be observed, although the learner’s own characteristics (e.g., needs, self-esteem, competence) may be the more significant determiner of attention. The second step is the retention phase, which involves the storage and retrieval of what was observed. Third is the reproduction phase, where the learner copies the observed behavior. Mental rehearsal, immediate enactment, and



**FIGURE 3-3** Social learning theory.

corrective feedback strengthen the reproduction of behavior. The fourth step is the motivational phase, which focuses on whether the learner is motivated to perform a certain type of behavior. Reinforcement or punishment for a role model's behavior, the learning situation, and the appropriateness of subsequent situations where the behavior is to be displayed all combine to affect a learner's performance (Bandura, 1977; Gage & Berliner, 1998). Well suited to conducting health education and staff development training, this organized approach to learning requires paying attention to the social environment, the behavior to be performed, and the individual learner (Aliakbari, Parvin, Heidari, & Haghani, 2015; Bahn, 2001).

Reflecting a social cognition orientation, Bandura (2001) then shifted his focus to socio-cultural influences, viewing the learner as the agent through which learning experiences are filtered. He argues that the human mind is not just reactive; it is generative, creative, and reflective. Essentially, the individual engages in a transactional relationship between the social environment and the self, where sociocultural factors are mediated by "psychological mechanisms

of the self-system to produce behavioral effects" (p. 4). In his model, Bandura stresses the internal dynamics of personal selection, intentionality, self-regulation, self-efficacy, and self-evaluation in the learning process. Culture and self-efficacy play a key role, with Bandura noting that individualistic cultures interpret self-efficacy differently from the way group-oriented cultures interpret it. However self-efficacy is defined, a low sense of self-efficacy in either kind of culture produces stress. This perspective applies particularly well to the acquisition of health behaviors and partially explains why some people select positive role models and effectively regulate their attitudes, emotions, and actions, whereas other people choose negative role models and engage in unhealthy and destructive behaviors. Nurses need to find ways to encourage patients' feelings of competency, to promote their wellness, and to make certain not to foster dependency, helplessness, and feelings of low self-worth in them.

Social learning theory extends the learning process beyond the educator–learner relationship to the larger social world. This theory helps explain the socialization process as well as the

breakdown of behavior in society. Responsibility is placed on the educator or leader to act as an exemplary role model and to choose socially healthy experiences for individuals to observe and repeat. This obligation requires the careful evaluation of learning materials for stereotypes, mixed or hidden messages, and negative effects. Yet simple exposure to role models correctly performing a behavior that is rewarded (or performing some undesirable behavior that is punished) does not ensure learning. Attention to the learner's self-system and the dynamics of self-regulation may help sort out the varying effects of the social learning experience.

In health care, social learning theory has been applied to nursing education, to community mental health settings, to addressing psychosocial problems, and to maximizing the use of support groups. For example, research indicates that those managers who are aware of their roles and responsibilities in promoting a positive work environment enhance learning, competence, and satisfaction. Dissatisfaction, in contrast, has a detrimental effect and is a significant cause of staff turnover (Kane-Urrabazo, 2006). Nurses have applied social learning principles successfully when working with teenage mothers (Stiles, 2005) and in addressing alcoholism among older adults (Akers, 1989). Mental health providers used a social learning theory paradigm to organize training and produce changes within their system to make employment a higher priority among community mental health services (Waynor, Pratt, Dolce, Bates, & Roberts, 2005). A major difficulty with applying social learning theory in practice is that this theory is complex and not easily operationalized, measured, and assessed.

The final two theories reviewed in this chapter focus on the importance of emotions and feelings in the learning process.

## Psychodynamic Learning Theory

Although not typically treated as a learning theory, some of the constructs from psychodynamic theory (based on the work of Sigmund Freud

and his followers) have significant implications for learning and changing behavior (Hilgard & Bower, 1966; O'Loughlin, 2013). It is largely a theory of motivation that stresses emotions rather than cognition or responses. The psychodynamic perspective emphasizes the importance of conscious and unconscious forces in guiding behavior, personality conflicts, and the enduring effects of childhood experiences on adult behavior. This theory may be especially useful to healthcare professionals (Bower, 2005; O'Loughlin, 2013). As Pullen (2002) points out, negative emotions are important to recognize and assess in nurse-patient-physician-family interactions, and psychodynamic theory can be helpful in this regard.

A central principle of the theory is the idea that behavior may be conscious or unconscious—that is, individuals may or may not be aware of their motivations and why they feel, think, and act as they do. According to the psychodynamic view, the most primitive source of motivation comes from the id and is based on libidinal energy (the basic instincts, impulses, and desires humans are born with). The id includes two components: *eros* (the desire for pleasure and sex, sometimes called the life force) and *thanatos* (aggressive and destructive impulses, or the death wish). Patients who survive or die despite all predictions to the contrary provide illustrations of such primitive motivations. The id, according to Freud, operates on the pleasure principle—to seek pleasure and avoid pain. For example, dry, dull lectures given by nurse educators who go through the motions of the presentation without much enthusiasm or emotion inspire few people (patients, staff, or students) to listen to the information or heed the advice being given. This does not mean, however, that only pleasurable presentations are acceptable.

Countering the id (primitive drives) is the superego, which involves the internalized societal values and standards, or the conscience. Mediating these two opposing forces in the personality is the ego, which operates based on the reality principle. Rather than insisting on immediate gratification, people learn to take the

long road to pleasure and to weigh the choices or dilemmas in the conflict between the id and the superego. Healthy ego (self) development, as emphasized by Freud's followers, is an important consideration in healthcare fields. For example, patients with ego strength can cope with painful medical treatments because they recognize the long-term value of enduring discomfort and pain to achieve a positive outcome. Patients with weak ego development, in contrast, may miss their appointments and treatments or engage in short-term pleasurable activities that work against their healing and recovery. A significant aspect of the learning and healing process involves helping patients develop ego strength and adjust realistically to a changed body image or lifestyle brought about by disease and medical interventions.

Nurses and other health professionals also require personal ego strength to cope with the numerous predicaments in the everyday practice of delivering care as they face conflicting values, ethics, and demands. Professional burnout, for example, is rooted in an overly idealized concept of the healthcare role and unrealistic expectations for the self in performing the role. Malach-Pines (2000) notes that burnout may stem from nurses' childhood experiences with lack of control.

When the ego is threatened, as can easily occur in the healthcare setting, **defense mechanisms** may be employed to protect the self. The short-term use of defense mechanisms is a way of coming to grips with reality. The danger arises from the overuse or long-term reliance on defense mechanisms, which allows individuals to avoid reality and may act as a barrier to learning and transfer. **BOX 3-2** describes some of the more commonly used defense mechanisms. Because of the stresses involved in health care, knowledge of defense mechanisms is useful, whether for nursing students who are grappling with the challenges of nursing education, staff nurses who are dealing with the strains of working in hospitals and long-term care facilities, or patients and their families who are learning to cope with illnesses and injuries.

### BOX 3-2 Ego Defense Mechanisms: Ways of Protecting the Self from a Perceived Threat

*Denial:* Ignoring or refusing to acknowledge the reality of a threat

*Rationalization:* Excusing or explaining away a threat

*Displacement:* Taking out hostility and aggression on other individuals rather than directing anger at the source of the threat

*Repression:* Keeping unacceptable thoughts, feelings, or actions from conscious awareness

*Regression:* Returning to an earlier (less mature, more primitive) stage of behavior as a way of coping with a threat

*Intellectualization:* Minimizing anxiety by responding to a threat in a detached, abstract manner without feeling or emotion

*Projection:* Seeing one's own unacceptable characteristics or desires in other people

*Reaction formation:* Expressing or behaving the opposite of what is really felt

*Sublimation:* Converting repressed feelings into socially acceptable action

*Compensation:* Making up for weaknesses by excelling in other areas

As an example of defense mechanisms in health care, Kübler-Ross (1969) points out that many terminally ill patients' initial reaction to being told they have a serious threat to their health and well-being is to employ the defense mechanism of denial. Patients typically find it too overwhelming to process the information that they are very ill or likely to die. Although most patients gradually accept the reality of their illness, the dangers are that if they remain in a state of denial, they may not seek treatment and care, and if their illness is contagious, they may not protect others against infection.

On the healthcare side, a common defense mechanism employed by medical staff is to intellectualize the significance of disease and

death rather than to deal with these issues realistically at an emotional level. This defense mechanism may contribute to the reported tendency of oncologists to ignore, rather than address, the emotions that patients express during communication (Friedrichsen & Strang, 2003; Pollak et al., 2007). One study found that in responding to patients expressing fear, oncologists more often addressed the topic causing the fear rather than addressing the emotion itself (Kennifer et al., 2009). Telford, Kralik, and Koch (2006) report that nurses may strive to categorize terminally ill patients within a denial–acceptance framework too quickly and, as a result, may not listen to patients as they attempt to tell their stories and interpret their illness experiences. Protecting the self (ego) by dehumanizing patients and treating them as diseases and body parts rather than as whole individuals (with spiritual, emotional, and physical needs) is an occupational hazard for nurses and other health professionals.

Another central assumption of psychodynamic theory is that personality development occurs in stages, with much of adult behavior derived from earlier childhood experiences and conflicts. One of the most widely used models of personality development is Erikson's (1968) eight stages of life, with the model organized around a psychosocial crisis to be resolved at each stage. Including considerations of the patient's stage of personality development is essential in health care when designing and carrying out treatment regimens, communication, and health education. For example, in working with 4- and 5-year-old patients, where the psychosocial crisis defined by Erikson is "initiative versus guilt," nurses should encourage the children to offer their ideas and to make and do things themselves. Staff also must be careful not to make these children feel guilty about their illness or misfortune. As a second example, an adolescent's developmental need to have friends and to find an identity requires special attention in health care. Adolescent patients may benefit from help and support in adjusting to a changed body image and in addressing their fears of weakness, lack of activity,

and social isolation. One danger is that young people may treat their illness or impairment as a significant dimension of their identity and self-concept—a perspective well described in poet Lucy Grealy's (1994) personal account in *Anatomy of a Face*.

According to the psychodynamic view, difficulties arise and learning is limited when individuals become fixated or stuck at an earlier stage of personality development. They then must work through their previously unresolved crises to develop and mature emotionally. For example, some staff members and patients feel an inordinate need to control the self, other people, and certain social situations. This behavior may be rooted in their inability to resolve the crisis of trust versus mistrust at the earliest stage of life. In working with these individuals, it is important to build a trusting relationship and to encourage them to gradually relinquish some control.

In some cases, past conflicts, especially during childhood, may interfere with the ability to learn or to transfer learning. What people resist talking about or learning—a process termed **resistance**—is an indicator of underlying emotional difficulties, which must be dealt with for them to move ahead emotionally and behaviorally. For instance, if a young, pregnant teenager refuses to engage in a serious conversation about sexuality (e.g., changes the subject, giggles, looks out into space, expresses anger), this behavior indicates that she has underlying emotional conflicts that need to be addressed. One study explored psychodynamic sources of resistance among nursing students and examined how they engaged with or resisted the learning process. A number of factors requiring consideration surfaced in this research, including childhood struggles, a history of overadaptation, self-image, and learning climate (Gilmartin, 2000).

Serious problems in miscommunication can occur in health care as a result of childhood learning experiences. For example, some physicians and nurses may have had the childhood experience of standing helplessly by watching someone they loved and once depended on endure

disease, suffering, and death. Although they could do little as children to improve the situation, they may be compensating for their childhood feelings of helplessness and dependency as adults by devoting their careers to fending off and fighting disease and death. These motivations, however, may not serve them well as they attempt to care for, communicate with, and educate terminally ill patients and their families.

Emotional conflicts are not always caused by internal forces, however; society exerts pressures on individuals that promote emotional difficulties as well. The reluctance of health professionals to be open and honest with terminally ill patients may be derived to some extent from American culture, which encourages medical personnel to “fix” their patients and extend life. Staff members may or may not be conscious of these pressures, but either way they may feel guilty and perceive themselves as failures when dealing with a patient who is dying.

The concept of transfer has special meaning to psychodynamic theorists. **Transference** occurs when individuals project their feelings, conflicts, and reactions—especially those developed during childhood with significant others such as parents—onto authority figures and other individuals in their lives. The danger is that the relationship between the health professional and the patient may become distorted and unrealistic because of the biases inherent in the transference reaction. For example, because patients are sick, they may feel helpless and dependent and then regress to an earlier stage in life when they relied on their parents for help and support. Their childhood feelings and relationship with a parent—for better or worse—may be transferred to a nurse or physician taking care of them. Although sometimes flattering, the love and dependency that patients feel may operate against the autonomy and independence they need to get back on their feet. A particular patient may also remind a staff member of someone from his past, creating a situation of countertransference.

The psychodynamic approach reminds nurses to pay attention to emotions, unconscious

motivations, and the psychological growth and development of all those involved in health care and learning. The success of health care rests on both interpersonal and intrapersonal processes integral to the therapeutic use of the self in carrying out patient care (Gallop & O’Brien, 2003). Psychodynamic theory is well suited to understanding patient and family noncompliance (Menahern & Halasz, 2000), trauma and loss (Duberstein & Masling, 2000), palliative care and the deeply emotional issues of terminal illness (Chochinov & Breitbart, 2000), and the anxieties of working with long-term psychiatric residents (Goodwin & Gore, 2000).

The psychodynamic approach has been criticized because much of the analysis is speculative and subjective, and the theory is difficult to operationalize and measure. Psychodynamic theory also can be used inappropriately; it is not the job of nurses with little clinical psychology or psychiatric training to probe into the private lives and feelings of patients to uncover deep, unconscious conflicts. Another danger is that nurses and other health professionals may use the many psychodynamic constructs as a way of intellectualizing or explaining away, rather than dealing with, people as individuals who need emotional care. Nonetheless, the psychodynamic perspective is helpful in more fully understanding learning and teaching because it highlights a number of underlying considerations and subtleties in the process, such as motivations, emotional development, and internal conflicts related to learning. It also gives focus to problems with learning or with the teacher–learner relationship.

## Humanistic Learning Theory

Underlying the humanistic perspective on learning is the assumption that every individual is unique and that all individuals have a desire to grow in a positive way. Unfortunately, positive psychological growth may be damaged by some of society’s values and expectations (e.g., males are less emotional than females, some ethnic groups are inferior to others, making money is more important than caring for people) and by

adults' mistreatment of their children and one another (e.g., inconsistent or harsh discipline, humiliation and belittling, abuse and neglect). Spontaneity, the importance of emotions and feelings, the right of individuals to make their own choices, and human creativity are the cornerstones of a humanistic approach to learning (Rogers, 1994; Snowman & McCown, 2015). Humanistic theory is especially compatible with nursing's focus on caring and patient centeredness—an orientation that is increasingly being challenged by an emphasis in medicine and health care on “impersonal” science, technology, cost efficiency, for-profit medicine, bureaucratic organization, and time pressures. Taking a skeptical approach, Traynor (2009) suggests the promotion of humanism in nursing in the United Kingdom, particularly by nurse scholars, may be based more on unexamined professional

ideology than on critical examination. This author encourages further scrutiny of the concept of humanism in the profession.

Like the psychodynamic theory, the humanistic perspective is largely a motivational theory. From a humanistic perspective, motivation is derived from each person's needs, subjective feelings about the self, and the desire to grow. The transfer of learning is facilitated by curiosity, a positive self-concept, and open situations in which people respect individuality and promote freedom of choice. Under such conditions, transfer is likely to be widespread, enhancing flexibility and creativity.

Abraham Maslow (1954, 1987), a major contributor to humanistic theory, is perhaps best known for identifying the **hierarchy of needs** (FIGURE 3-4), which he says plays an important role in human motivation. At the bottom



**FIGURE 3-4** Maslow's hierarchy of needs.

Modified from Maslow, A. (1987). *Motivation and personality* (3rd ed.). New York, NY: Harper & Row.

of Maslow's hierarchy are physiological needs (food, warmth, sleep); then come safety needs, then the need for belonging and love, followed by self-esteem. At the top of the hierarchy are self-actualization needs (maximizing one's potential). Additional considerations include cognitive needs (the desire to know and understand) and, for some individuals, aesthetic needs (the desire for beauty). Within this model, it is assumed that basic-level needs must be met before individuals can be concerned with learning and self-actualizing. Thus, clients who are hungry, tired, and in pain are motivated to get these biological needs met before they will be open to learning about their illness, rules for self-care, and health education. Although this model is intuitively appealing, research findings in support of Maslow's hierarchy of needs have been inconsistent. For example, although some people's basic needs may not be met, they may nonetheless engage in creative activities, extend themselves to other people, feel a subjective sense of well-being, and enjoy learning (Pfeffer, 1985; Tay & Diener, 2011).

Besides personal needs, humanists contend that self-concept and self-esteem are necessary considerations in any learning situation. The therapist Carl Rogers (1961, 1994) argues that what people want is unconditional positive self-regard (the feeling of being loved without strings attached). Experiences that are threatening, coercive, and judgmental undermine the ability and enthusiasm of individuals to learn. Therefore, those in positions of authority need to convey a fundamental respect for the people with whom they work. If a nurse is prejudiced against patients with AIDS, for example, then little will be healing or therapeutic in that nurse's relationship with them until she is genuinely able to feel respect for each patient as an individual.

Rather than acting as an authority, say humanists, the role of any educator or leader is to serve as a facilitator (Rogers, 1994). Listening—rather than talking—is the skill needed. Because the uniqueness of the individual is fundamental to the humanistic perspective, much of the learning experience requires a direct relationship

between the educator and the learner, with instruction being tailored to the needs, self-esteem, and positive growth of each learner. Learners—not educators—choose what is to be learned. Within this framework, educators serve as resource persons whose job is to encourage learners to make wise choices. Because the central focus is on learners' perceptions, desires, and decision making, the humanistic orientation is referred to as a learner-directed approach.

Mastering information and facts is not the central purpose of the humanistic model of learning. Instead, fostering curiosity, enthusiasm, initiative, and responsibility is considered more important and enduring and should be the primary goal of any educator. For example, rather than playing health education videos for hospitalized patients to view or routinely distributing lots of pamphlets and pages of small-print instructions, the humanistic perspective would suggest establishing rapport and becoming emotionally attuned to patients and their family members. In professional education, the goal is to provide psychologically safe classrooms and clinical environments, where humanistic principles can be taught through caring, role modeling, small-group interactions, and case discussions. Attention to self-awareness and feelings are crucial. Helpful techniques include role playing, listening exercises, and filming students in the clinical setting (Biderman, 2003). Providing time for student reflection is essential, and instructor feedback must be given sensitively and thoughtfully (Fryer-Edwards et al., 2006).

Feelings and emotions are the keys to learning, communication, and understanding in humanistic psychology. Humanists worry that in today's stressful society, people can easily lose touch with their feelings, which sets the stage for emotional problems and difficulties in learning (Rogers, 1961). To humanists, "Tell me how you feel" is a much more important instruction than "Tell me what you think" because thoughts and admonitions (the latter of which Rogers calls "the shoulds") may be at odds with true feelings. Consider the implications of the following

statements: (a) a young person who says, “I know I should go to medical school and become a doctor because I am smart and that is what my parents want, but I don’t feel comfortable with people who are sick—I don’t even like them!” and (b) the patient who is dying and says, “I realize that I am going to die and should be brave, but I feel so sad that I am losing my family, my friends, and myself; frankly, I am afraid of dying—all the pain and suffering, being a burden—I’m scared!” In both cases, humanists would argue, the overriding factor that will affect the behavior of the young person and the patient who is dying is their feelings, not their cognitions.

The humanistic learning theory has modified the approach to education and changing behavior by giving primary focus to the subjective needs and feelings of the learner and by redefining the role of the educator. Humanistic principles have become a cornerstone of self-help groups, wellness programs, and palliative care. Humanistic theory also has been found to be well suited to working with children and young patients undergoing separation anxiety caused by illness, surgery, and recovery (Holyoake, 1998) and to working in the areas of mental health and palliative care (Barnard, Hollingum, & Hartfiel, 2006). As in psychodynamic theory, a principal emphasis is on the healing nature of the therapeutic relationship (Pearson, 2006) and the need for nursing students and staff to grow emotionally from their healthcare experiences (Block & Billings, 1998).

The theory has its weaknesses as well. Research has not been able to substantiate some of its strongest claims, and the theory has been criticized for promoting self-centered learners who cannot take criticism or compromise their deeply felt positions. Charged with being more of a philosophy—or a cult—than a science, humanism has a touchy-feely aspect that makes some learners and educators feel truly uncomfortable. Moreover, information, facts, memorization, drill, practice, and the tedious work sometimes required to master knowledge—which humanists minimize and sometimes disdain—have been found to contribute to significant learning,

knowledge building, and skill development (Gage & Berliner, 1992).

Following in the tradition of humanistic theory is positive psychology, which is more oriented to health and well-being than to learning per se (Lopez, Pedrotti, & Snyder, 2014). The emphasis is on positive emotions and optimism, which appears to make it well suited to health care. However, positive psychology has its share of critics (Ehrenrich, 2009). In relation to health care, some family members and medical professionals may earnestly encourage patients to be positive and think themselves well. Yet, this pressure can overburden patients, and some may blame themselves (or be blamed by others) if they do not improve and their illness or injury worsens.

## ► Neuropsychology and Learning

A rapidly growing area of psychology research involves investigations into the physiological and neurological foundations of thinking, learning, and behavior. **Neuropsychology** is the scientific study of psychological behavior based on neurological assessments of the brain and central nervous system. Neuropsychology is not a theory but a body of research that may be applied to psychological aspects of behavior, including learning (Benjamin, de Belle, Etnyre, & Polk, 2008; Kolb & Whishaw, 2015; Sousa, 2012).

Neuropsychology is a branch of psychology that contributes to the neurosciences, which draws researchers from medicine, chemistry, physiology, engineering, physics, and other disciplines. Neuroscientists are concerned with studying the brain and central nervous system’s structures, anatomy, chemistry, electrical activity, hormones, and neurotransmitters as these affect functioning and behavior. From this perspective, learning is viewed as involving changes in the brain and central nervous system that affect responses and behavior. To these researchers,

learning occurs at the cellular level and produces structural changes in brain structure, wiring patterns, and chemistry (Collins, 2016).

Much of the information in neuropsychology has been gained through advances in neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET). Other methodologies employed include animal studies based on surgery, electrical recordings such as electroencephalograms (EEG) and event-related potentials (ERP), and case studies of children and adults with head trauma, brain lesions, and neurological abnormalities (Byrnes, 2001). The resulting findings highlight the underlying biological mechanisms of learning and provide evidence to support some of the principal constructs and dynamics of existing learning theories.

In synthesizing neuropsychology research, many generalizations about learning can be made (Collins, 2016; Gazzaniga, 2000; Page, 2006; Phelps, 2006; Prichard, 2014; Shors, 2006; Silverstein & Uhlhaas, 2004). Each of the following generalizations has implications for health education in the clinical setting, and readers are encouraged to formulate applications to nursing and health care:

- Emotions have been found to play a key role in Pavlovian conditioning, information processing, memory, and motivation. Emotions are considered to interact with cognitive factors in any learning situation, suggesting that they cannot be ignored when teaching, learning, reasoning, or making decisions.
- Neuropsychology research has confirmed the validity of learning theories and constructs, including gestalt principles, constructivism, Piaget's notions of assimilation and accommodation, and Freud's conceptualization of conscious and unconscious processes.
- In studying the dynamics of brain and central nervous system processing of information, this research has documented the role of physiological arousal and has tracked attention, perception, and the organization of experience while learning.
- Learning is a function of physiological and neurological developmental changes that are ongoing and dynamic—the brain is now viewed as less fixed than once thought, and it changes with learning and experience (a phenomenon called **plasticity**).
- Brain processing is different for each learner; thus, methods of gaining the learner's attention, controlling the amount and pace of learning, and identifying the specific mechanisms for enhancing learning are unique for each person.
- Meaningful practice strengthens learning connections, which may fade from lack of use; therefore, one-shot patient education efforts are not likely to be effective in permanently changing behavior.
- Stress can interfere with or stimulate learning, although the responses to stress may change with age and differ for males and females and for those who have experienced traumatic events.
- Neuropsychology research has confirmed that learning is an active, multifaceted, complex process that involves preferred and interacting sensory modes. It is colored by the past and present social context, and is regulated largely by the learner based on his or her development, physiological state, experiences, and sense of self. Think for a moment about the ramifications of these findings for healthcare education, learning, and teaching.

Neurophysiological aspects of learning become even more germane for children and adults with physiological disorders; for individuals with mental, emotional, and behavioral problems; and for persons facing the stresses of trauma, disease, disability, and socioeconomic hardship. The following are some implications for teaching, learning, and memory (Collins, 2016; Prichard, 2014):

- Consider the physiological, mental, and emotional condition of the learner, such as nutrition, hydration, the need for stimulation

or rest, novelty, and adequate time to process, store, and relate information.

- Organize and pace learning; be playful and explore.
- Anchor new learning to something already known or familiar; put the learning into context.
- Take breaks, including the opportunity to exercise or shift focus, to allow the learning to “sink in” or incubate.
- And yes, we can teach old dogs new tricks—thanks to brain plasticity—but there are physiological and developmental limits regarding what is reasonable and possible for every individual.

A few cautions. Despite numerous neuroscientific studies related to learning, this line of research is in its early stages and remains fragmented, scattered, and lacking in integration. In addition, neuropsychological studies may be based on animal research or involve highly specialized and restricted human samples. As a result, few broad generalizations can be made based on such limited samples. And as Murphy (2016) points out, there are issues with the various equipment and techniques used to measure and assess neuropsychological activity along with the challenge of inferring what it all means for human behavior and learning.

Although addressing the various biological connections to learning and behavior is currently a popular and relatively well-funded area of research, there is a risk of reducing human behavior to mere biology. Critics charge that this narrow focus ignores the individual as a person and neglects the significance and complexity of psychological and social processes in any learning situation. As Prichard (2014) argues, “brain-based learning” oversimplifies learning (p. 116). Another of his criticisms is that this physiological explanation for learning has produced a “commercial bandwagon” for companies to exploit to make money, such as computer games and costly workshops to “train the brain.” With so much emphasis on the brain and physiology in learning, considerations related to the

learner as a person and the effects of the social environment on learning easily can be forgotten. Criticisms aside, concepts derived from neuropsychology are especially useful to nurses who are educating patients dealing with medical and health problems.

## ► Comparison of Learning Theories

**TABLE 3-1** provides a comparative summary of the five psychological learning theories outlined in this chapter. Nurse educators can make generalizations about both the differences and the similarities in what the theories say about acquiring knowledge and changing feelings, attitudes, and behavior. With respect to some of the differences among the theories, each theory has its own assumptions, vocabulary, and way of conceptualizing the learning process. The theories differ in their emphasis on the relative influence of external or internal factors in learning, the view of the learner as more passive or active, the task of the educator, the explanation for motivation, and the way in which the transfer of learning is accomplished.

A logical question is which of these five theories best describes or explains learning—which theory, in other words, would be the most helpful to nurses interested in increasing knowledge or changing the behavior of patients, staff, or themselves? The answer to this question is that each theory contributes to understanding various aspects of the learning process and can be used singly or in combination to help practitioners acquire new information and alter existing thoughts, feelings, and behavior.

Each theory highlights important considerations in any learning situation, involving the relative influence of external social factors and internal psychological processing. For example, behaviorists urge nurses in the role of teaching others to pay attention to and change stimulus conditions and to provide reinforcement to alter behavior. Although criticized for

**TABLE 3-1** Summary of Learning Theories

Learning Procedures	Assumptions About the Learner	Educator's Task	Sources of Motivation	Transfer of Learning
<b><i>Behaviorist</i></b>				
Environmental stimulus conditions and reinforcement promote changes in responses. To change behavior, change the environment.	Passive, reactive learner responds to environmental conditions (stimuli and reinforcement).	Active educator manipulates stimuli and reinforcement to direct learning and change.	Drive reduction	Practice Similarity in stimulus conditions and responses between learning and new situations
<b><i>Cognitive</i></b>				
Internal perception and thought processing within a context of human development promote learning and change. To change behavior, change cognitions.	Active learner determines patterning of experiences, is strongly influenced by attributions.	Active educator structures experiences (through organization and meaningfulness) to encourage the reorganization of cognitions.	Goals Expectations Disequilibrium	Mental and physical activity Common patterns Understanding Learning to learn
<b><i>Social Learning</i></b>				
External role models and their perceived reinforcement along with learner's internal influences. To change behavior, change role models, perceived reinforcement, and the learner's self-regulating mechanisms.	Active learner observes others and regulates decision to reproduce behavior.	Active educator models behavior, encourages perception of reinforcement, carefully evaluates learning materials for social messages, and attempts to influence learner's self-regulation.	Socialization experiences, role models, and self-reactive influences (observe self, set goals, and reinforce performance)	Similarity of setting and role models' behavior

Learning Procedures	Assumptions About the Learner	Educator's Task	Sources of Motivation	Transfer of Learning
<b>Psychodynamic</b>				
Internal forces such as developmental stage, childhood experiences, emotional conflicts, and ego strength influence learning and change. To change behavior, change interpretations and make unconscious motivations conscious.	Active learner's lifestyle, past experiences, and current emotional conflicts influence what is learned and how it is remembered and performed.	Educator as a reflective interpreter makes sense of learner's personality and motivation by listening and posing questions to stimulate conscious awareness, insight, and ego strength.	Pleasure principle and reality principle Tension and imbalance Conscious and unconscious influence of conflict, development, and defense mechanisms	Personality conflict, resistance, and transference associated with learning situations may act as barriers to transfer.
<b>Humanistic</b>				
Internal feelings about self, ability to make wise choices, and needs affect learning and change. To change behavior, change feelings, self-concept, and needs.	Active learner attempts to actualize potential for positive self-growth and confirm self-concept; learner is spontaneous, creative, and playful.	Facilitative educator encourages positive self-growth, listens empathetically, allows freedom of choice, and respects learner.	Needs, desire for positive self-growth, and confirmation of self-concept	Positive or negative feelings about self and freedom to learn promote or inhibit transfer.

being reductionistic, behaviorism is admittedly simpler and easier to use than trying to undertake a massive overhaul of an individual's internal dynamics (perceptions, cognition, memory, feelings, and personality history and conflicts). Moreover, asking someone first to behave in a more appropriate way (abstaining from bad habits and engaging in healthy behavior) may not be as threatening or daunting to the learner as it is to suggest the need for internal personality changes. Desired responses are modified and strengthened through practice, and the new

learned responses, in turn, may lead to more fundamental changes in attitudes and emotions. The behaviorist aspects of social learning theory are relatively straightforward as well, such as using effective role models, who, by their example, demonstrate exactly what behaviors are expected and are perceived as rewarded.

Cognitive, social learning, psychodynamic, and humanistic theories remind nurses to consider internal factors—perceptions, thoughts, ways of processing information, feelings, and emotions. When teaching others, nurses cannot

afford to ignore these factors because, ultimately, the learner controls and regulates learning—or how information is perceived, interpreted, and remembered and whether the new knowledge is expressed or performed.

In practice, psychological learning theories should not be considered mutually exclusive but rather they operate together to change attitudes and behavior. As an illustration: patients undergoing painful procedures are first taught systematic desensitization (behaviorist) and while experiencing pain or discomfort are encouraged to employ imagery, such as thinking about a favorite, beautiful place or imagining the healthy cells gobbling up the unhealthy cells (cognitive). Staff members are highly respectful, upbeat, and emotionally supportive of each patient (humanistic) and create the time and opportunity to listen as patients discuss some of their deepest fears and concerns (psychodynamic). Waiting rooms and lounge areas for patients and their families are designed to be comfortable, friendly, and pleasant (gestalt) to facilitate conversation and interaction (humanist). Support groups may help patients and family members learn from one another about how to cope with illness or disability and how to regulate their emotions so that their health is not further compromised (social learning). And it always needs to be kept in mind that learning requires attention and active brain processing, which are affected by the physiological state of the learner, often involve emotions, and depend on the organization, pace, and amount of material to be learned and practiced (neuropsychology, cognitive).

Another generalization from this discussion is that some psychological learning theories are better suited to certain kinds of individuals than to others. Theoretical assumptions about the learner range from passive to highly active. Passive individuals may learn more effectively from behaviorist techniques, whereas curious, highly active, and self-directed persons may do better with cognitive and humanistic approaches. Also, educators must keep in mind that some learners require external reinforcement and incentives,

whereas other learners do not seem to need—and may even resent—attempts to manipulate and reinforce them. Individuals who are well educated, verbal, and reflective may be better candidates for cognitive and psychodynamic approaches, whereas behaviorist approaches may be more suitable for persons whose cognitive processes are impaired or who are uncomfortable dealing with abstractions or scrutinizing and communicating their thoughts and emotions.

In addition, an individual's preferred modes of learning and processing (learning style) may help determine the selection of suitable theoretical approaches. That is, although some individuals learn by acting and responding (behaviorist), the route to learning for others may be through perceptions and thoughts (cognitive) or through feelings and emotions (humanistic and psychodynamic). When teaching a group, multiple approaches and ways of processing information are needed. Most people appear to benefit from demonstration and example (social learning).

## ► Motor Learning

Because nurses teach motor skills to patients, family members, staff, and students at one time or another, it is important for them to explore theories and applications of motor learning in addition to theories of psychological learning (Cano-de-la-Cuerda, et al., 2015). For example, Wulf, Shea, and Lewthwaite (2010) stress the importance of and need for motor skill training in medical education. Theories and variables of motor learning are useful when teaching skilled movement-related activities in a variety of settings, ranging from acute care to rehabilitation to home care. The patient learning to walk with crutches, the student learning to take a blood pressure, the nurse learning to irrigate an indwelling catheter, and the family member learning to assist with ostomy care can all benefit from the application of motor learning principles. The objective of this section is to summarize selected aspects of this topic that are relevant and applicable to a wide variety of

teaching and learning situations involving nurses, patients, colleagues, and students. The discussion here is not intended to provide an exhaustive review of the vast topic of motor learning.

Nurses teach patients and family members an assortment of skills that can range from walking to putting on a colostomy bag, and they teach students and colleagues skills that range from simple procedures to operating sophisticated medical equipment. Using theory and evidence to support and guide them as they teach motor skills can help make nurses' instruction more effective and efficient. **Motor learning** is defined as "a set of processes associated with practice or experience leading to relatively permanent changes in the capability for movement" (Schmidt & Lee, 2005, p. 302). It differs from **motor performance**, which involves initial acquisition of a skill but not necessarily longer term retention of that skill (Schmidt & Wrisberg, 2004). All too often, nurses tend (erroneously) to equate *performance* of a skill with *learning*. For example, a nurse may demonstrate a skill to the patient, such as changing a sterile dressing, and then ask the patient to "teach back" the skill. If the patient does it relatively accurately, it is assumed that the skill has been "learned." Yet when the patient is asked to carry out the skill 2 days later during a home visit, the patient may not be able to perform the skill. He may struggle with the order of the steps of changing the dressing, or forget how to keep the field sterile, or not be able to manipulate the bandages. As this example suggests, performance in the moment is not always an accurate reflection of learning because the performance can be influenced by many variables, and the changes observed in the skill may be only temporary. Retention, which involves demonstrating a skill over time and after a period of no practice, indicates that true learning has occurred (O'Sullivan & Portney, 2014).

Multiple theories of motor learning have been proposed (Adams, 1971; Newell, 1991; Schmidt, 1975), as is true for theories related to stages of learning motor skills (Fitts & Posner, 1967; Gentile, 1972). Each theory has its own clinical implications and limitations (Shumway-Cook &

Woollacott, 2017). Applying different aspects of these theories to patient care and education is challenging because so many variables affect the desired outcome and because research in this area has often yielded contradictory results. Different individual characteristics, different types of tasks and skills, and different environments all affect a patient's, student's, or staff member's ability to learn a motor skill. For example, Smits, Verschuren, Ketelaar, and van Heugten (2010) suggest that attending to patients' learning styles can enhance the efficiency of learning and the effectiveness of outcomes during motor skill learning in rehabilitation. Wulf, Chiviawowsky, and Cardozo (2014) discovered that by supporting a person's autonomy (giving them a choice) and providing positive feedback during task performance increased self-efficacy and positively influenced motor learning. Lewthwaite, Chiviawowsky, Drews, and Wulf (2015) also found that allowing a person to have task-relevant control during motor performance satisfies a psychological need and enhances learning outcomes.

## Stages of Motor Learning

Similar to Cronbach's concept of the learning curve (see Chapter 10), Fitts and Posner's (1967) three-stage sequential model of motor learning is a classic model that provides a framework for nurses to use as they organize learning strategies for patients, students, and staff nurses. Within this model, the three phases of skill learning are identified as follows:

1. The cognitive stage
2. The associative stage
3. The autonomous stage

In the first (cognitive) stage, the learner works to develop an overall understanding of the skill, called the **cognitive map** or **cognitive plan**—basically solving the problem of "what is to be done." Learners must consciously focus and pay attention in this stage. During this stage of learning, the use of specific teaching techniques and strategies is probably the most beneficial (Nicholson, 2002).

Instructional strategies for the educator during this stage include:

- Emphasizing the purpose of the skill in a context that is functionally relevant to the learner
- Pointing out similarities to other learned motor skills
- Minimizing distractions
- Using clear and concise instructions
- Demonstrating ideal performance of the skill
- Breaking down complex movements into parts, where appropriate
- Encouraging the learner to verbalize the instructions and watch the movement
- Providing some manual guidance but also allowing for errors in performance (Kisner & Colby, 2012; O'Sullivan & Portney, 2014)

Initially, nurses can expect irregular performance with many errors. Eventually, however, learners become able to process sensory cues and organize their perceptual-motor system to carry out reasonable approximations of the skill (O'Sullivan & Portney, 2014). Rapid improvement but variable performance characterizes this stage.

The second (associative) stage of motor learning entails more consistent performance, slower gains, and fewer errors (Schmidt & Lee, 2005). The patient, student, or staff nurse focuses on “how to do” the skill. The goal in this stage is to fine-tune the skill through continued practice. During this stage, better organization is evident, and the movement becomes coordinated and more accurate (O'Sullivan & Portney, 2014). Dependence on visual cues decreases and movement feedback becomes more important. In this stage, nurses can continue to provide opportunities for practice, emphasizing how the movement feels and assisting learners in finding the safest and most efficient ways to carry out the skills. Helpful instructional strategies for this stage include the following:

- Increasing the complexity of the task
- Increasing the level of distraction in the environment
- Encouraging learners to practice independently

- Emphasizing problem solving
- Decreasing guidance and feedback
- Avoiding manual guidance (Kisner & Colby, 2012)

Nurses should promote learner self-assessment by encouraging identification of both mistakes and success before providing feedback. They should intervene only when errors appear to be consistent (O'Sullivan & Portney, 2014).

The third and final (autonomous) stage of motor learning is the automatic stage, during which speed and efficiency of performance gradually improve and which requires little attention and conscious information processing (Nicholson, 2002). An advanced level of skill is achieved and the learner can perform different tasks simultaneously and in changeable environments. In this stage, learners no longer must “think about” the skill. Nurses can set up progressively more difficult activities in this stage and provide more challenging environments (Kisner & Colby, 2012). Unfortunately, some patients with disabilities never reach this stage, and most patients are discharged from healthcare facilities prior to reaching this stage.

## Motor Learning Variables

It is clear from a review of motor learning research that the variables of practice and feedback have widespread clinical applications for nurses. Gaining an understanding of these variables can assist nurses in optimizing their motor-skill teaching with patients, family members, students, and staff.

## Prepractice

Certain variables can influence motor learning even before the learner begins to practice the skill. Nurse educators, for example, must be concerned with prepractice variables that include motivation, attention, goal setting, and understanding of the task goals (Kisner & Colby, 2012; Nicholson, 2002). These variables are particularly important when nurses work with patients who have illnesses or disabilities that may impair their ability

to focus on a task. Goals should be measurable and achievable and should focus on a functional task. Family members and patients should have input into the goals, and the task should be meaningful to the learner. In addition, the nurse must determine whether the learner understands the goals and the strategies for achieving a task and is able to pay attention to the task.

Modeling and/or demonstration almost always should be a part of teaching any task. For example, a nurse working in the home care setting with a patient who is recovering from a stroke may believe the most important goal for the person is to be independent in the self-monitoring of his blood pressure. The patient, in contrast, might believe that being able to use the toilet independently is all he wants to work on, claiming that he does not feel comfortable having his wife help him in the bathroom. In order for the nurse to take advantage of the patient's drive and enthusiasm, it makes sense to set this task as an initial goal and work at a later time on the self-monitoring of his blood pressure. Before teaching the patient how to safely use the toilet, the nurse makes sure the patient pays close attention as she explains the steps that are involved with safely getting on and off the toilet, and she confirms that he has a verbal understanding of those activities. The stage is now set for the nurse to demonstrate and then practice this task with him.

## Practice

Practice is the most important factor in developing and retaining motor skills. The amount, type, and variability of practice all affect how well a target skill is acquired and retained (Schmidt & Lee, 2005). Because skill in performance generally increases as a direct function of time spent practicing, staff and family members need to continuously reinforce the skills taught by nurses and other health professionals. This emphasis on reinforcement reflects behaviorist theory, as discussed previously in this chapter.

Types of practice variables include massed versus distributed practice, variability of practice, whole versus part practice, random versus

blocked practice, guidance versus discovery learning, and mental practice. Each type of practice has advantages and disadvantages and specific populations for which it is better suited.

**Massed practice** is a sequence of practice and rest times in which practice time greatly exceeds the time off task (Schmidt & Lee, 2005). For example, nurses may use massed practice when teaching students to take blood pressure readings. The nurse educator might ask the student to practice taking 15 blood pressure readings in sets of 3 with only a short period of rest between sets. Massed practice can lead to fatigue and possible injury, so it must be used with caution when treating at-risk populations. This type of practice has been shown to markedly decrease motor performance in continuous tasks (such as walking, which involves repetitive, uninterrupted movements); however, massed practice seems to affect learning only slightly when learning is measured on a transfer task in distributed conditions (Shumway-Cook & Woollacott, 2017). Thus, the decrease in performance that occurs with massed practice does not seem to affect retention negatively. This finding likely reflects the effect of fatigue in masking the original learning outcomes during massed practice. Massed practice is useful when working with individuals with high levels of motivation and skill who exhibit good endurance, attention, and concentration (O'Sullivan, 2014).

**Distributed practice** consists of spaced practice intervals in which the amount of rest (or time off task) between practice times is equal to or greater than the amount of time within each practice trial (Schmidt & Lee, 2005). This format is more typical of the type of practice nurses might use in a hospital setting where, because of the severity of their conditions, patients need frequent rest periods as they learn to manipulate necessary medical equipment, walk, or perform self-care activities. Distributed practice results in the most learning in relation to training time, but the total training time is typically increased as compared to massed practice (Schmidt & Lee, 2005). It is the preferred mode of practice for individuals with limited endurance and for those

who are at risk of injury—a description that applies to many of the patients seen in the health-care environment (O’Sullivan, 2014).

An important goal for learning new motor skills is that patients, staff, and students are able to transfer their learning to new situations or new tasks. For example, nurses often teach patients how to get in and out of the chair next to their hospital bed. The goal is that patients can transfer the learning to the new situations they face at home when they try to get in and out of their own kitchen and living room chairs. Researchers have noted that the more closely the sensory, cognitive, and motor processing demands in the practice environment resemble those in the actual environment, the better the transfer of learning will be (Schmidt & Lee, 2005; Winstein, 1991a). For this reason, it is important to use a variety of chairs in the hospital that resemble chairs at home when teaching this task and not to only limit practice to the chair next to the bed.

Variable practice conditions also appear to increase an individual’s ability to generalize learning to new situations and seem to be particularly effective for children and adult females (Schmidt & Lee, 2005). Research in which subjects practiced a timing task showed that those who practiced at variable speeds were more successful than those who practiced at constant speeds in transferring the learning to a novel speed situation (Catalano & Kleiner, 1984). According to Shumway-Cook and Woollacott (2017), using variable practice conditions may be most important when teaching tasks that the patient will perform in diverse conditions. For example, patients need to practice walking under as many different conditions as possible (e.g., in a busy corridor, in a narrow hallway, on different surfaces) to help them generalize the skill to the novel conditions and environments they will face when they return home. With regard to self-care tasks such as self-catheterization, patients need to practice these types of tasks in multiple settings, such as in bed, on a commode, and in a public restroom.

Nurses often break down tasks into component parts for easier learning. The effectiveness

of this type of teaching depends on the type of task they are trying to teach the patient or other learner. Breaking tasks into smaller units is an effective way to teach tasks that can be naturally divided into segments that reflect the inherent goals of the task or that require information processing versus coordination (Nicholson, 2002; Winstein, 1991a). For example, the tasks of giving an injection or setting up a sterile field both have many components that need to be performed in an orderly fashion. Some components of these tasks, such as measuring out the dosage, drawing up the medication, or opening packages of bandages, are more difficult than others. Breaking these types of tasks into their component parts is an effective way to teach the tasks completely. Conversely, when the task to be learned involves timing between segments and coordinated movements, such as in a continuous task like walking, practice should focus on the whole task rather than on component parts (Nicholson, 2002).

An interesting and counterintuitive finding of motor learning research is that some factors that make the initial performance of a task more difficult may make learning more effective (Shumway-Cook & Woollacott, 2017). These factors, first identified by Battig (1966) in verbal learning studies, are called **contextual interference effects** (Brady, 2008). It is natural to assume that practicing several different tasks in blocked order (practicing one specific task repeatedly and uninterrupted in a block, and then the next task in a block, and then the third task in a block) would make for more effective learning than practicing the tasks in random order (defined as high contextual interference). However, this is not necessarily the case. Although blocked practice makes initial acquisition of the skill easier, some research shows that it is not as effective as random practice for applying the motor skill in other environments and for longer term retention (Shumway-Cook & Woollacott, 2017; Wulf & Schmidt, 1997). In random practice, it is hypothesized that a greater depth of cognitive processing develops while

the individual is retrieving information from memory stores (O'Sullivan, 2014).

As an illustration, the concept of contextual interference effect can be applied to the earlier example of the patient in the hospital learning how to get into the chair from the hospital bed. Once the patient has a basic understanding and some ability to perform the task, it may be better for the nurse to vary the practice routine and have the patient work on all the different skills the nurse would like her to achieve in random order. Rather than just practicing getting in the chair for a set number of trials, and then performing breathing exercises, and then walking, the nurse can vary the order of the activities in the training session: The patient can practice getting in and out of the chair and then perform breathing exercises, go back to the task of getting up from the chair again for several trials, walk for a while, do breathing exercises again, repeat getting in the chair, and continue the activities in random order.

When deciding whether to use blocked or random practice, the nurse must consider characteristics of both the task and the learner. Individual characteristics such as intellectual ability and experience levels may influence the outcome of random practice (Rose, 1997). In fact, random practice has not been found to be superior to blocked practice in adolescents with Down syndrome (Edwards, Elliott, & Lee, 1986) or in a pilot study of adults with Parkinson disease (Lin, Sullivan, Wu, Kantak, & Winstein, 2007). Patients who need a high degree of consistency and structure for learning may benefit the most from blocked practice (O'Sullivan, 2014). In a comprehensive review of the subject, Brady (2008) suggests that the contextual interference effect may be weaker in application than it is in basic research.

Nurses routinely give verbal and physical (manual) guidance to assist a patient or student in performing tasks. Such guidance seems to be most effective during the initial stages of teaching a task when the task is unfamiliar to the learner and for tasks that are slow in time (Schmidt & Lee, 2005). Too much guidance,

however, can interfere with learning because it does not allow the learner to solve problems on his or her own. Therefore, it is important for nurses to resist the common urge to give continual direction and assistance to patients and students, especially once the learners are familiar with the task and demonstrate some degree of physical performance.

The opposite of guidance is trial and error or **discovery learning**—a cornerstone of cognitive and humanistic theories. This type of teaching presents learners with challenging, yet achievable problems and encourages them to discover their own solutions. Discovery learning seems to be less effective in terms of increasing the speed of initial skill acquisition but more effective for later transfer and retention of the skill (Schmidt & Wulf, 1997; Singer, 1980). For example, a nurse might introduce students to an unfamiliar piece of equipment, tell them to figure out how the equipment works, and then leave the classroom for about 15 minutes. The instructor in this case contends that many students learn how to operate equipment more effectively by having time initially to discover for themselves before being formally taught how to use medical equipment. Discovery learning is important, the instructor maintains, because throughout their careers nurses face the prospect of having to learn for themselves how to use new and updated equipment in a variety of practice settings.

Whereas physical practice is best for learning a motor skill, **mental practice** (imagining or visualizing the skill without body movement) can also have positive effects on the performance and learning of the skill (Dickstein & Deutsch, 2007). In fact, Allami, Paulignan, and Brovelli (2008) found that high rates of imagery even led to performance and learning levels similar to those of physical practice in an object-slot task. Research indicates that when mental practice is used together with physical practice, motor skill acquisition is enhanced (Gentili, Papaxanthis, & Pozzo, 2006; Hamel & Lajoie, 2005) and occurs at a faster rate than with physical practice alone (Malouin, Richards, Doyon, Desrosiers, &

Belleville, 2004; Page, Levine, Sisto, & Johnston, 2001). Several researchers assert that at least some degree of familiarity with the task is necessary for mental imagery practice to be successful (Mulder, Zijlstra, Zijlstra, & Hochstenbach, 2004; Mutsaerts, Steenbergen, & Bekkering, 2006). Nevertheless, patients who cannot carry out physical practice of motor skills as a result of fatigue, pain, or impairments are often good candidates for the technique of mental practice alone. Patients who are too ill to exercise or get out of bed can gain a head start on learning by mentally “practicing” these activities. They can do so by reviewing with the nurse the steps for getting out of bed and then imagining themselves carrying out those steps, one after the other. Mental practice also can help to increase self-efficacy (Callow, Hardy, & Hall, 2001; Martin, Moritz, & Hall, 1999) and can decrease anxiety in patients who are apprehensive about making the initial movement, perhaps because of fear of falling or pain (O’Sullivan, 2014). When possible, mental practice should be combined with physical practice to increase the rate and quality of skill learning.

## Feedback

Feedback plays a critical role in promoting motor learning and is considered the second most important element involved with learning a skill after practice (Bilodeau, 1966; Newell, 1976). Feedback can be either intrinsic or extrinsic. **Intrinsic (inherent) feedback** is the sensory and perceptual information that arises when a movement is produced and can include both visual and somatosensory information. **Extrinsic (augmented or enhanced) feedback** is information provided to the learner from an outside source (Schmidt & Wrisberg, 2004). The outside source can be the nurse, or it can be some type of instrumentation, such as biofeedback.

Extrinsic feedback supplements intrinsic feedback. Variables to consider when giving extrinsic feedback include the type, timing, and frequency of feedback. Types of extrinsic

feedback include knowledge of results (KR) and knowledge of performance (KP). KR is terminal feedback about the outcome of the movement relative to the movement’s goal, whereas KP is feedback about the movement pattern used to achieve the goal (Schmidt & Lee, 2005). For example, a nurse working with a patient who is learning to care for an ostomy gives the patient KP feedback when she says, “You coordinated your hands really well when you were removing your old pouch from your skin.” A little later in the session, the nurse gives KR feedback when she says, “You put your new pouch on with a nice, tight seal.” Extrinsic feedback can be given at the same time as the task (concurrently) or immediately after the task, or it can be delayed for a specified amount of time. Also, it can be given continuously or intermittently.

Some types of skills, such as tracking tasks, depend more on KP, whereas KR is more important in other types of tasks, such as transfers, where information is needed to shape the general movements for the next attempt at the task (O’Sullivan, 2014). Research by Wulf, Hob, and Prinz (1998) demonstrates that focusing a person’s attention on the outcomes of movements (KR) enhances learning more than when the person focuses on the details of the movements.

Nurses also need to adjust the timing of feedback during the learning process. Initially, concurrent, continuous feedback may be necessary in the early stages of teaching a skill to ensure safety and understanding; however, continuous feedback can interfere with learning over time. For example, suppose the nurse seeks to teach a patient how to give herself an injection. Initially, the nurse must show the patient how to hold the needle, often physically guiding the placement of the patient’s hands on the needle. He also tells the patient step by step how to proceed with the injection, giving praise along the way when the patient is successful. If the nurse continues to give this level of extensive concurrent feedback each time the patient practices, it may retard the patient from learning the skill. For retention and longer term learning, learners

need to self-detect and self-correct errors, so educators should use the least amount of concurrent feedback for the shortest time possible (Gentile, 2000). Nurses often can find withholding feedback challenging because many view giving large amounts of concurrent feedback is a way of positively supporting the patient or student. Nevertheless, intermittent feedback during practice promotes learning more effectively than does continuous feedback. Immediate, postresponse feedback, in which the nurse provides knowledge of the outcome of the task right after each trial, is often used in the early stages of learning. Although this type of feedback may enhance early skill performance, it also delays learning (Kisner & Colby, 2012).

Effective learning includes retention. Providing continuous feedback interferes with learners' development of the ability to solve problems and self-detect errors (Kisner & Colby, 2012). Conversely, feedback that is not given after every trial (summary feedback) slows initial skill acquisition but improves performance on retention tests (Winstein & Schmidt, 1990). Winstein (1987, 1991b) has demonstrated that progressively decreasing the rate at which feedback is given, called fading of feedback, appears to be most effective in promoting learning. Fading feedback and using summary feedback (allowing several repetitions of a task before providing feedback) are good ways of reducing the amount of feedback the nurse provides. For example, the nurse teaching a patient to use an incentive spirometer first explains and demonstrates its use. He or she then allows the patient to practice using the spirometer two or three times (if no harmful errors occur) before giving feedback about how good a seal the patient made around the device, how deeply he or she inhaled, and how well the patient held his or her breath. Eventually, the nurse "fades" the feedback and gives it after four or five trials rather than after two or three, hoping the patient will self-correct any errors.

The extensive use of any type of augmented feedback can create dependence on the feedback, so nurses need to develop a comfort level

that balances safety and support with allowing patients and students to solve problems, self-monitor, and self-correct when learning new motor skills. **BOX 3-3** reviews the practice variables and feedback variables in motor learning.

Including motor learning principles in their repertoire adds depth and breadth to the teaching skills of nurses. Although different areas of the brain are involved in motor learning as compared to psychological learning, considerable overlap occurs and the integration and application of both sets of principles are necessary for optimal teaching and learning of motor skills. Selective aspects of some psychological theories—such as reinforcement from behaviorist theory, the gestalt and information-processing perspective from cognitive theory, modeling from social learning theory, and focusing on subjective needs and feelings of the learner from humanistic theory—are seminal to the teaching of motor skills.

Although a large body of complex research has been published about motor learning, following several simple guidelines can help nurses be more effective when they teach motor skills to patients or to students. Nurses should remember to do the following:

1. Practice motor skills with patients and students as much as possible, and encourage other staff and family members also to practice skills with patients.
2. Encourage mental practice prior to or along with motor practice.
3. Make sure patients and students understand the purpose of the skill, and give clear guidance and assistance in the initial stages of learning.
4. Vary the conditions of learning as much as possible.
5. Within the limits of safety, decrease the amount of guidance and feedback to allow learners to solve problems, make mistakes, and self-correct errors.

Nurses who consistently apply knowledge of the three stages of motor learning and the

## BOX 3-3 Practice and Feedback Variables in Motor Learning

### Practice Variables in Motor Learning

- *Massed practice*: Practice time is more than rest time (off task).
- *Distributed practice*: Rest time (off task) is the same as or greater than practice time.
- *Variability of practice*: The task is practiced under a variety of conditions.
- *Whole-task practice*: The entire task is practiced at once.
- *Part–task practice*: The task is divided into its component parts and each part is practiced separately.
- *Random practice*: A variety of tasks are practiced in random order over different trials.
- *Blocked practice*: One task is practiced continuously without interruption before proceeding to the next task to be learned.
- *Guidance practice/learning*: Physical and verbal guidance are provided while practicing the task.
- *Discovery practice/learning*: While practicing a task the learner is encouraged to find a solution to a challenging yet attainable problem.
- *Mental practice*: The learner cognitively rehearses a motor task without any body movement.

### Feedback Variables in Motor Learning

- *Intrinsic (inherent) feedback*: Sensory and perceptual information originates from the learner when movement is produced.
- *Extrinsic (augmented or enhanced) feedback*: Supplemental information is provided from an outside source such as the teacher or instrumentation when movement is produced.
- *Knowledge of results (KR) feedback*: Terminal feedback is provided about the outcome of the movement relative to the movement goal.
- *Knowledge of performance (KP) feedback*: Feedback about the movement pattern used to achieve the goal is given.
- *Continuous feedback*: Feedback is ongoing during performance of the movement.
- *Intermittent feedback*: Feedback occurs randomly and irregularly during performance of the movement.
- *Concurrent feedback*: Feedback occurs during performance of the movement.
- *Postresponse (terminal) feedback*: Feedback occurs after completion of the movement:
  - Immediate: Occurs directly after the movement is completed
  - Delayed: Occurs after an amount of time to allow reflection by the learner
  - Summary: Occurs after several repetitions of the movement and describes average performance

Data from Dickstein, R., & Deutsch, J. E. (2007). Motor imagery in physical therapist practice. *Physical Therapy, 87*(7), 942–953; Kisner, C., & Colby, L. A. (2012). *Therapeutic exercise: Foundations and techniques* (6th ed.). Philadelphia, PA: F. A. Davis; O’Sullivan, S. B. (2014). Strategies to improve motor function. In S. B. O’Sullivan, T. J. Schmitz, & G. D. Fulk (Eds.), *Physical rehabilitation* (6th ed., pp. 393–443). Philadelphia, PA: F. A. Davis; Schmidt, R. A., & Lee, T. D. (2005). *Motor control and learning: A behavioral emphasis* (4th ed.). Champaign, IL: Human Kinetics; Schmidt, R. A., & Wrisberg, C. A. (2004). *Motor learning and performance: A problem-based learning approach* (3rd ed.). Champaign, IL: Human Kinetics; Shumway-Cook, A. S., & Woollacott, M. H. (2017). *Motor control: Translating research into clinical practice* (5th ed.). Philadelphia, PA: Wolters Kluwer.

variables of practice and feedback when teaching motor skills to patients, students, and colleagues give themselves the best chances for successful teaching outcomes.

The next section discusses common principles of learning integrating information from all the learning theories presented in this chapter.

## ► Common Principles of Learning

Taken together, the theories discussed in this chapter indicate that learning is a more complicated and diverse process than any one theory

implies. Besides the distinct considerations for learning suggested by each theory, the similarities among the perspectives point to some core features of learning. The following questions raised at the beginning of the chapter can be addressed by synthesizing the learning theories and identifying their common principles.

## How Does Learning Occur?

Learning is an active process that takes place as individuals interact with their environment and incorporate new information or experiences with what they already know or have learned. Factors in the environment that affect learning include the society and culture, the structure or pattern of stimuli, the effectiveness of role models and reinforcements, feedback for correct and incorrect responses, and opportunities to process and apply learning to new situations.

Furthermore, the individual exerts significant control over learning, with that control often reflecting his or her physiological state, developmental stage, history (habits, cultural conditioning, socialization, childhood experiences, and conflicts), cognitive style, dynamics of self-regulation, conscious and unconscious motivations, personality (stage, conflicts, and self-concept), and emotions. Although learners often have a preferred mode for taking in information (visual, motor, auditory, or symbolic), using multiple sensory modes often facilitates learning. Although some individuals may learn best on their own, others benefit from expert guidance, social interaction, and cooperative learning.

Learning is an individual matter. Neuropsychology research is beginning to document the uniqueness of each person's way of actively perceiving and processing information, as well as his or her flexibility and reactions to stress. Thanks to research, much more is known these days about the impact of culture and emotions on how and what is learned and remembered—compared to when people supported the saying “Spare the rod and spoil the child,” believing that humiliation and punishment aided learning.

A critical influence on whether learning occurs is motivation. The learning theories reviewed here suggest that to learn, the individual must want to gain something (i.e., receive rewards and pleasure, meet goals and needs, master a new skill, confirm expectations, grow in positive ways, or resolve conflicts), which in turn arouses the learner by creating tension (i.e., drives to be reduced, disequilibrium, and imbalance) and the propensity to act or change behavior.

The relative success or failure of the learner's performance may affect subsequent learning experiences. In some cases, an inappropriate, maladaptive, or harmful previously learned behavior may need to be extinguished and then replaced with a more positive response. As noted earlier, it is easier to instill new learning than to correct faulty learning. That is why it is smart to invest time and care in the early stages of learning and make sure what is learned is accurate or correct.

## Which Kinds of Experiences Facilitate or Hinder the Learning Process?

The educator exerts a critical influence on learning through role modeling, the selection of learning theories, and the way a learning experience is structured for each learner. To be effective, educators must have knowledge (of the material or skill to be learned, the learner, the social context, and educational psychology), and they must be competent (be imaginative, flexible, and able to employ teaching methods; display solid communication skills; and able to motivate others).

All the learning theories discussed in this chapter acknowledge the need to recognize and relate the new information to the learner's past experiences (old habits, previous skills, culture, familiar patterns, childhood memories, feelings about the self, and what is valued, normative, and perceived as successful or rewarded in society). The ultimate control over learning rests with the learner, but effective educators influence

and guide the process so that learners advance in their knowledge, skills, perceptions, thoughts, emotional maturity, or behavior.

Ignoring these considerations, of course, may hinder learning. Other impediments to learning may involve a lack of clarity and meaningfulness in what is to be learned; fear, neglect, or harsh punishment; and negative or ineffective role models. Providing inappropriate materials for an individual's ability, readiness to learn, or stage of life-cycle development creates another obstacle to learning. Moreover, individuals are unlikely to want to learn if they have had detrimental socialization experiences, are deprived of stimulating environments, or lack goals and realistic expectations for themselves.

## What Helps Ensure That Learning Becomes Relatively Permanent?

Four considerations assist learning in becoming permanent. First, the likelihood of learning is enhanced by organizing the learning experience, making it meaningful and pleasurable, recognizing the role of emotions in learning, and pacing the teaching session in keeping with the learner's ability to process information. Second, practicing (mentally and physically) new knowledge or skills under varied conditions strengthens learning. The third issue concerns reinforcement: Although reinforcement may or may not be necessary, some theorists have argued that it may be helpful because it serves as a signal to the individual that learning has occurred and thereby acts as feedback for learners. This also means that rewarding individuals when they have not learned or giving rewards prior to a learning session works against the usefulness of giving rewards for learning.

A fourth consideration involves whether learning transfers beyond the initial educational setting. Learning cannot be assumed to be relatively lasting or permanent; it must be assessed and evaluated by the educator soon after the learning experience has occurred as well as through follow-up measurements made at later times. Research skills, knowledge of evaluation

procedures, and the willingness and resources to engage in assessment are now considered essential responsibilities of the educator in carrying out the teaching–learning process. Evaluation feedback can then be used by the nurse educator to revamp and revitalize learning experiences.

## ► State of the Evidence

The study of learning in educational psychology is based on evidence from research, similar to research-based evidence that is advocated in nursing, medicine, and health care. Rather than assuming the instructor knows best, researchers gather evidence and test learning theories, teaching methods, and beliefs about learners, teachers, and the environment. The research results are then evaluated to determine if the theories, methods, applications, and assumptions about learning need to be modified.

Ideally in health education, existing research in psychology, nursing, and medicine is used to design learning experiences for patients, families, and communities. The same is true for developing, implementing, and evaluating teaching and learning experiences for nursing students and staff. Based on research findings, what does not work is eliminated, modifications grounded in additional research are made, and new programs are attempted and assessed. Educational accountability is stressed, and decisions about how to educate must be justified based on data and research. Times change, settings change, and people change, so research must be an ongoing process of monitoring and updating what we know about learning and education.

The applications of the learning theories and principles discussed in this chapter are illustrated by many research studies in nursing, psychology, education, and health care. Because of this research, nurses can feel more confident about their ability to choose the most appropriate theories and principles for each educational experience and hone their approach to teaching and learning in the healthcare setting. Educational research has confirmed many of the constructs and principles from the various learning

perspectives. It also provides evidence to dispute some of the conventional wisdom and myths about learning—for example, helping nurses as educators realize that punishment is not generally effective and may inhibit learning, and continual guidance, practice, and feedback are not always better. Also, when teaching people, keep in mind that strongly held beliefs—that may or may not be rational—will strongly influence each learner’s processing of the educational experience. The research on learning in general and health care in particular demonstrates clearly that no one-size-fits-all approach works in educating patients, nursing students, or nursing staff. To be effective, educational experiences need to be refined and tailored to each individual learner.

Although many advancements have been made in understanding the learning process over the past century, much remains unknown and requires careful research, such as why some patients and nursing students are much more eager to learn than are others and what can be done to encourage reluctant learners to change their attitudes or behavior. We also need a lot more research on how the various learning theories and principles can work together to benefit every learner and how the healthcare setting changes the teaching–learning situation. In the future, more interdisciplinary efforts between psychologists and nurses are needed to move toward a more sophisticated level of research and understanding that can be applied to the healthcare setting.

Research is not a panacea, however. Critics charge that the widely promoted, research-based evidence approach to education and health care is peculiar to these professions and places the emphasis on outcomes rather than on the process of learning. The challenges of measurement are immense and require a highly sophisticated knowledge of research methods and their weaknesses—always keeping in mind that attempts to measure and evaluate learning can oversimplify the complexity and nuances of learning. No small challenge these days is the lack of resources, support, and well-trained personnel needed to truly implement and sustain a research-based approach to teaching and learning (Ferguson & Day, 2005).

## ► Summary

This chapter demonstrates that learning is complex and diverse. Readers may feel overwhelmed by the different theories, sets of constructs and learning principles, and the specific cautions associated with employing the various approaches. Yet, like the blind men exploring the elephant, each theory highlights an important dimension that affects the overall learning process, and together the theories provide a wealth of complementary strategies and alternative options. There is, of course, no single best way to approach learning, although all the theories indicate the need to be sensitive to the unique characteristics and motivations of each learner. For additional sources of information about psychological theories of learning and health care, see **BOX 3-4**.

Educators in the health professions cannot be expected to know everything about the teaching and learning process. More important, perhaps, is that they can determine what needs to be known, where to find the necessary information, and how to help individuals, groups, and themselves benefit directly from a learning situation. Psychology and nursing work well together. Psychology has much to contribute to

### BOX 3-4 Psychological Theories of Learning and Health Care Weblinks

Graduate Student Instructor Teaching and Resource Center, University of California, Berkeley: <http://gsi.berkeley.edu/gsi-guide-contents/learning-theory-research/learning-overview/>

American Psychological Association (search for principles of learning): <http://www.apa.org/>

Instructional Design, Learning Theories: <http://www.instructionaldesign.org/theories/>

SlideShare: Teaching and Learning Aids: <http://www.slideshare.net/jellyways/aids-and-applications-for-easier-learning-and-teaching-finals>

National Institutes of Health (search for patient education topics): <http://www.nih.gov>

healthcare practice, and nursing is in a strategic position to apply and test psychological and motor learning principles, constructs, and theories in both educational and clinical settings.

## Review Questions

1. What are the five psychological learning theories discussed in this chapter?
2. What are the principal constructs and contributions of each of the five psychological learning theories?
3. According to the concept of operant conditioning, what are three techniques to increase the probability of a response, and what are two techniques to decrease or extinguish the probability of a response?
4. What are some ways the behaviorist theory (which focuses on the environment and responses to it) and the cognitive perspective (which emphasizes the individual's internal processing) could be combined to facilitate knowledge acquisition or change a health behavior?
5. How do the major psychological learning theories compare to one another with respect to their similarities and differences?
6. How does motivation serve as a critical influence on whether learning occurs?
7. Which types of experiences can hinder the learning process?
8. Which factors help ensure that learning becomes relatively permanent?
9. What are some ways that emotions might be given more explicit consideration in nursing and patient education?
10. Describe some of the implications of neuropsychology research for nurses conducting patient education?
11. In motor learning, how do the instructional strategies used during the associative stage of learning differ from those used during the cognitive stage?
12. What is the difference between performance and learning?
13. Which variables make initial skill acquisition more difficult but strengthen retention and learning?
14. How do the different types of practice and feedback variables affect motor learning?
15. Which of the learning theories and principles of learning do you think will be the most useful in conducting patient education? Briefly explain why for each of your choices.

## CASE STUDY

You are designing an education session for your colleagues on transitioning from a paper-based documentation system to an electronic medical record (EMR) system. Time is of the essence, and you have three 1-hour sessions planned to cover the information they need to incorporate the new EMR system into their daily practice. Several of your colleagues are concerned about their ability to master the new system. Jack, the nursing unit supervisor, confides, "I am terrified. Learning a whole new system of documentation is overwhelming to my staff, given so many of their other responsibilities. I worry that this new EMR system will have a negative impact on morale, just at the time when we are feeling pressure to increase the amount of work that we do."

1. Describe how you will structure the educational sessions using two of the psychological learning theories discussed in this chapter. Explain why you chose each theory.
2. Judge which learning theory can best assist you in addressing the issues your colleagues raise about their ability to master the new system and feelings of being overwhelmed. Why did you choose this theory?
3. What can you do to ensure that learning will become relatively permanent?

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