

4

Chapter

BEHAVIORAL AND SOCIAL LEARNING THEORIES





What's It All About ...

What is behaviorism?

How do we learn by associating events that occur together?

How do consequences shape the way we learn?

In what ways do social relationships affect our learning?

Chapter Objectives

- Define general learning.
- Describe learning from the behavioral perspective.
- Understand the theories of Pavlov and Watson and the importance of contiguity.
- Define the basic components of classical conditioning.
- Distinguish between generalization and discrimination.
- Explain extinction.
- Describe the limitations of classical conditioning.
- Understand the similarities and difference between the theories of Thorndike and Skinner.
- Define reinforcement.
- Describe the schedules of reinforcement.
- Define punishment.
- Distinguish between shaping and extinction.
- Describe how to modify antecedent conditions.
- Explain applied behavior analysis.
- Review the limitations of operant conditioning.
- Describe Bandura's theory of modeling and observational learning.
- Define social cognitive theory.
- Explain self-regulation.

EXTENDED OUTLINE

Behavioral and Social Learning Theories

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- III. Behaviorism—A Focus on What We Do
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 - B. Behavioral perspective
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 - B. Social cognitive theory
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- VII. The Chapter in Review
- VIII. Interdisciplinary Case Focus

From Today's Headlines

Vol. I No. 4

Teaching World, 2012

Paying Students for Better Grades Is Partially Effective, Study Says ...

The Examiner, Baltimore, MD,
by Mike Silvesteri

It is one of the most controversial educational practices—paying students for grades. Many object to the idea, but some schools are convinced that paying students for increases in academic performance is both effective and ethical.

Baltimore City schools are using a financial incentive program to help encourage students to perform academically.

Their decision is based in part on research that shows financial incentives are associated with higher academic scores. The article cites a research study from the Center for Research on Education Outcomes at Stanford University, which shows that incentives can improve academic performance. This study of one hundred charter schools across the nation showed that providing students with incentives increased some aspects of academic performance. They also indicated that incentives do not necessarily have to involve money. For example, some incentive programs involved allowing students to pelt their principal with water balloons.

The Baltimore city schools use shoes as well as money (up to \$110) as incentives.

Proponents of the Baltimore plan believe that incentives help energize students and facilitate engagement in the learning process. Opponents believe that paying for grades sends the wrong message, believing that learning should be its own reward.

MAKE THE CONNECTION

Paying students for grades is an excellent example of the often controversial world of behavior management. In this chapter, we will closely examine theories behind such practices. We will begin by reviewing how students learn by associating events that occur together. We will then move on to learning that is shaped by consequences like receiving money for grades. There is no question that behavioral principles are effective tools of change in certain circumstances, but it is important for teachers to understand how to use them effectively and appropriately.



BEHAVIORISM—A FOCUS ON WHAT WE DO

The next time you are in a crowded room, look around at what the other people are doing. Perhaps some are walking purposefully to the nearest exit. Some people may be reading the newspaper or talking with a friend. The world is filled with people engaging in a wide range of behaviors every minute of every day. Looking at people's behavior often leads to questions. "Why are they doing that?" "What are they talking about?" The answers are actually quite complicated. Answering the question, "Why do people behave as they do?" depends upon your individual perspective. For each of us, certain aspects of a situation are more important than others. For example, in an attempt to figure out why one student is yelling at another, some of us would wonder, "What is he thinking about?" Others would want to know, "What could possibly motivate him to behave like that?" This chapter strives to help you understand the behavior you see people engaged in, a focus on what people *do*. Other important questions, such as what people *think* about, will be covered in the next chapter.

Learning

Sophie, an eight-year-old in Mr. Prine's third grade class, is working on learning her multiplication facts. Last week, when her teacher asked what four times three was, she replied "Sixteen."

Today, she not only knows the correct answer to four times three, but she also knows all of the three and four multiplication facts. What accounts for this change in behavior? Did she study hard after school with her older sister? Did she merely mature physically, leading to a natural expansion in her multiplication skills. Perhaps, she knew her three and four multiplication tables six months ago but was not feeling well last week and could only remember the answer to three times four, instead of four times three. All of these situations relate to learning. Defining learning is relatively straightforward; however, explaining and changing behavior often requires considerable expertise.

Learning Defined

In the broadest sense, **learning** refers to a lasting change in an individual resulting from experience (Gredler, 2001; Mazur, 1990). So, exactly what happened when Sophie learned her multiplication facts? What is it about Sophie that changed because of her learning experience? Did she increase her knowledge, change her behavior, or change structures within her brain? Depending on the theoretical perspective we use to view Sophie's learning, the answer will be very different. As was mentioned in the opening remarks to the chapter, learning means different things to different people. Let's take a look at some of those different points of view.

Learning Orientations

One could probably list many different perspectives on behavior, but this text will focus on only a few of the most prominent. For example, a *cognitive* psychologist might say Sophie increased her knowledge through memorization. Cognitive psychology focuses on an individual's ability to think and reason. A *neuroscientist* might say that she formed new connections between cells of the brain. Neuroscience is just beginning to make meaningful contributions to the advancement of education. We might also focus on Sophie's *motivation* to study or the benefit of *social* relationships to support academic success. Motivation and social learning are covered later in the text. A *behaviorist* would say that Sophie exhibited a change in her overt behavior, or her ability to say her multiplication facts. Focusing on behavior, we can see, is the hallmark of the behavioral perspective and is the primary focus of this chapter.



► A student's outside factors, such as studying hard or not feeling well, can contribute to what is remembered while learning.

Learning

A lasting change in an individual resulting from experience

Behavioral Perspective

Like all historical events, the behavioral perspective emerged in a historical context. When behaviorism first emerged, our society was undergoing widespread changes, which made it possible for this perspective on learning to flourish in psychological and educational circles. Although this text focuses on psychology as it relates to education, the behavioral movement extended well beyond the classroom. The next section describes the historical events surrounding the widespread endorsement of the behavioral point of view. We will also introduce some basic terminology behaviorists use to describe behavior.

Founding of Behaviorism

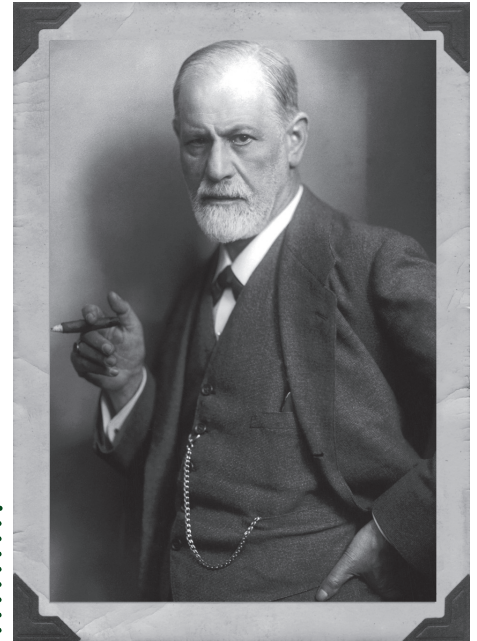
In the late 1800s, the predominant school of thought in psychology was psychoanalytic theory, founded by Sigmund Freud. His theory placed an emphasis on internal events and subconscious thoughts. For example, Zack may display an almost obsessive desire to achieve. Subconsciously, he feels that if he does not succeed, he will not be loved. If asked about his strong desire to achieve, he might show little insight, reporting he “likes to get A’s.” Additionally, Freud believed much of our mental life was influenced by events occurring in childhood. Perhaps Zack received conditional care and support from his parents during childhood, which led to his unknowing search for love and acceptance. This perspective thrived across the world for many years, but ultimately people became dissatisfied with the ability of this approach to account for behavior. For example, if you have a high school student experiencing depression and, therefore, lacks engagement in school, what is the cause? The Freudian point of view would focus on thoughts and feelings, particularly those impacted by childhood events the student may not even remember. This focus on unconscious thoughts lacked specificity and made it difficult to investigate and apply Freudian theory in a consistent way.

The behavioral perspective emerged partly in reaction to Sigmund Freud’s theoretical orientation (Freud & Strachey, 1964), as well as to other theories of the mind prominent at that time. In the early 1900s, John Watson asserted that psychology should be objective and scientific, as opposed to the subjective and theoretical work of Freud and his followers (Watson, 1913, 1928, & 1931). Watson proposed a new psychology that focused on observable events and behavior (called overt behavior). He asserted that inferring the existence of phenomena that occur inside a person, like thinking or feeling, was unnecessary and unscientific. Watson’s ideas were appealing to many scientists, and research in the behavioral tradition spread rapidly. Behavioral researchers have uncovered a number of basic principles of learning; and there are many direct applications of this research, from education and parenting to marketing and business. In short, our understanding of learning is influenced in a significant way by the contribution of behavioral research. Additionally, the behavioral perspective has much to offer in the way of direct applications in the classroom. We turn now to a more detailed exploration of the behavioral perspective and its basic terminology.

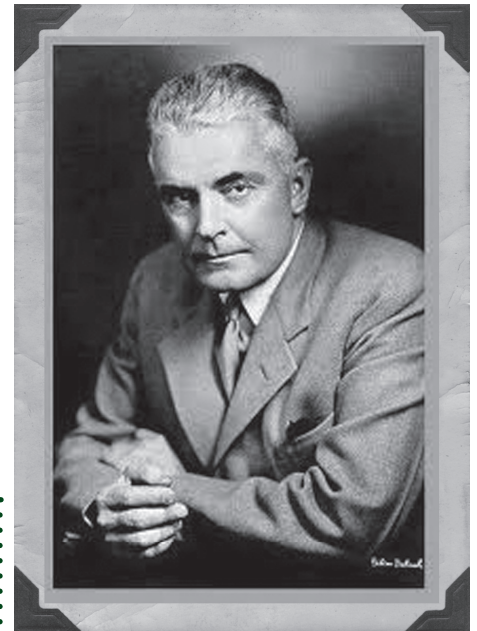
Behavioral Terminology

Behaviorists view environmental experience as the central force in learning. This means we behave based upon the experiences we have during our life. This leads to a focus on observable behaviors or things that we can actually observe people do. Recall that from a behaviorist’s perspective, internal mental events are theoretical and not appropriate for scientific study. Using this behaviorally based definition of learning, researchers have studied behavior for over one hundred years, contributing much to our understanding of learning.

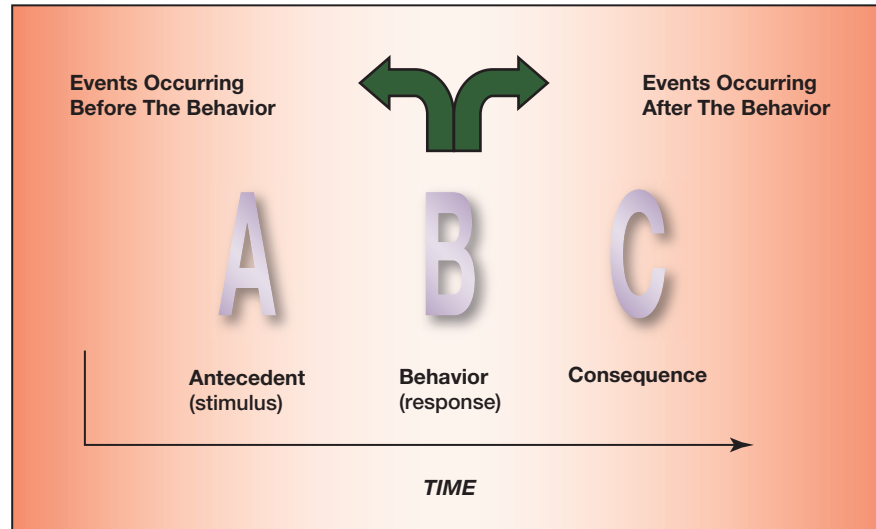
Students of behavioral theory must first begin to view the world as an endless stream of interconnected behaviors. That is, any given behavior is impacted by preceding events and will influence, in turn, future behaviors. Think about your own behaviors since you woke up today. What led you to that first action after you opened your eyes? What happened next? What events early in the day affected later events? Again, behavior is ongoing, without a specific beginning or end.



► Sigmund Freud



► John Watson

Figure 4.1Key Terms Used in
Behavioral Theory

So, how then do we examine behavior occurring in such an endless stream of events? Typically, the behaviorist begins by picking out some *behavior of interest*. Perhaps you are interested in why a student hit another student, or why one student cheated by looking at another student's exam. What is important is that the behavior of interest is clearly defined. Next, the behaviorist may attempt to figure out what events led up to the behavior of interest, as well as what happened immediately after the behavior.

The key terms used in behavioral theory involve a specific environmental stimulus, the response that follows, and the potential association between the stimulus and the response (Burton, Moore, & Magliar, 1996; Carr & Briggs, 2011). For example, being called on to answer a question (a stimulus) might make your heart race (a response). Behaviorists are concerned with how such associations are made, how they are strengthened or weakened, and how they are maintained. Events leading to a response are referred to as the **stimulus**. Some stimuli play a role in the expression of behavior and are, therefore, called **antecedents**, which simply refer to an event occurring before the behavior of interest and having an effect on its expression. Behaviorists also study how responses are changed by the events that come after the stimulus. Events occurring after a behavior of interest are called **consequences**. For example, the teacher notices the student's panic when she calls on him and gently guides him to the correct answer. This consequence will probably lead to a different response the next time. Reviewing this basic approach to naming the important factors in the ongoing stream of behavior, we first have the behavior of interest, which is called the response. Again, it is often a good idea to begin applying behavioral theory by clearly defining the behavior of interest. Events preceding the response are called antecedents, and events coming after the response are called consequences. Figure 4.1 provides a graphical depiction of this typical naming convention. Using the first letter of each of the important terms makes the acronym A B C, which students usually find easy to remember.

Stimulus

Event leading to a response

AntecedentAn event occurring before
the behavior of interest,
having an effect on its
expression**Consequence**Event occurring after the
behavior of interest

SUMMARIZE AND REFLECT

1. Learning is defined as a lasting change in an individual resulting from experience.
2. Researchers study learning from many perspectives. Some scientists view learning as a change in knowledge resulting from experience, while others focus on experience related changes in the brain. Behaviorists view learning as a change in behavior occurring because of experience.
3. Behavioral theory is based on the fundamental assumption that the focus of psychology is on observable behavior only.
4. Early behaviorists, such as John Watson, asserted that the existence of phenomena that occur inside a person, such as thinking or feeling, couldn't be proven scientifically. He strongly proposed that psychology should be limited to the objective and scientific study of observable behavior.

(continues)

5. Behaviorists use a common approach to defining and understanding behavior. Behaviorists focus on a given behavior (response), relevant antecedent events (stimuli), and events occurring after the behavior (consequences).

INFORMED APPLICATION

1. As a ninth grade teacher, you consistently have a problem with students becoming restless five minutes before the end of each period. Based on behavioral principles, what aspects of this problem are relevant when trying to design a behavior modification program?
2. Teachers often struggle with getting students to internalize basic math facts like multiplication tables. This issue can be approached from different perspectives. If the teacher operates from a behavioral perspective, what is she going to emphasize to help the students learn more effectively?

CLASSICAL CONDITIONING— LEARNING BY ASSOCIATION

Now that we have reviewed the basic idea behind behavioral theory, we will begin with the first of the three behavioral theories covered in this chapter. This section covers a type of behavioral theory called classical conditioning. **Classical conditioning** is a behavioral theory based on our ability to learn by associating events that co-occur in the environment. Using the terms from the previous section, the theory is based on the association made between a stimulus and response in our environment. For example, you experience a sense of excitement at the sight of your biology teacher because you associate her with fun classroom experiments. This type of learning emphasizes the importance of learning through events occurring together in time. This co-occurrence of events (e.g., a stimulus and a response) is called **contiguity**. Before we turn to a more detailed account of the processes involved in classical conditioning, let us first look at the individuals whose research brought us this important theory and the historical events surrounding its discoveries.

Classical conditioning

A behavioral theory based on our ability to learn by associating events that co-occur in the environment

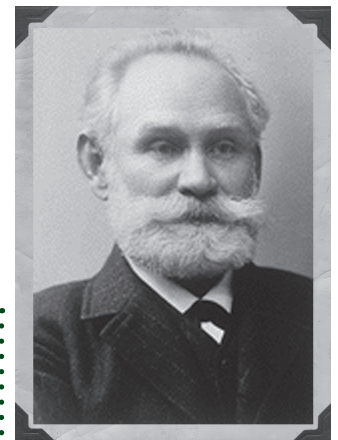
Contiguity

The co-occurrence of events

Pavlov and Watson: Importance of Contiguity

The story of classical conditioning begins with a Russian physiologist named Ivan Pavlov (1849–1936). Pavlov was one of world’s most renowned scientists. His work on the physiology of digestion led to the Nobel Prize in 1904 and was followed by additional outstanding achievements while he served as Director of Russia’s Institute of Experimental Medicine. His primary research focus was the investigation of digestion using an experimental method that allowed for continuous monitoring of organ systems in live animals. Related to this research, he began to investigate the causes of salivation in dogs. A colleague proposed that a “mental” reflex, or an automatic response, caused salivation to food. Through a series of experiments, Pavlov was able to show that sometimes salivation is learned, rather than an automatic process. Based on this research, he believed he discovered a fundamental building block of learning. His theory indicated we are born with certain behavioral responses to the environment; however, we can *learn* to extend this foundation, responding in new ways that are sensitive to the world around us. For example, we may be born with a tendency to exhibit fear when we encounter an unexpected loud noise—a startle response. We can, however, learn to startle to other environmental stimuli, such as the sight of a large dog. Pavlov called this type of learning *classical conditioning*, and he believed it explained the behavioral capabilities of lower animals and humans (Pavlov, 1928).

In 1903, as Pavlov was first presenting his findings at the International Medical Congress in Madrid, a young American psychologist named John B. Watson was receiving his doctoral degree. Watson was strongly influenced by the work of Pavlov and studied many of his principles as they applied to the physiology and behavior of animals. As a professor of psychology at The Johns Hopkins University, Watson also began to study Pavlovian conditioning in human infants. He believed humans were indeed more complicated than lower animals but generally operated on the same principles. In 1913, he published a paper detailing his ideas,



► Ivan Pavlov

essentially founding what would become the *Behavioral School of Psychology*. This “school” was essentially a group of researchers who embraced Watson’s perspectives on learning. This was an important event because this school of thought would dominate psychology for the next fifty years, dramatically influencing society through educational and child-rearing practices.

Basic Components of Classical Conditioning

The process of classical conditioning begins with instinctive behaviors we do not have to learn, such as salivating at the sight of food or being startled by the sound of a loud noise (Abramson, Brown, & Langley, 2011). Consider the behavior of the following children: Jane touches a hot stove and immediately withdraws her hand. Bill hears a loud noise and startles. Michael hits

his head and begins to cry. A behavior occurred in each of these examples. The question is, did any of these children learn their reactions? Are they examples of behaviors we come into this world prepared to exhibit? Pavlov believed they were unlearned behaviors and referred to them **unconditioned responses (UCR)**. Pavlov used the term *conditioned* to refer to learning; therefore, something that is unconditioned is something that does not have to be learned. Table 4.1 presents a few examples of potential unconditioned responses. In addition to proposing a term for behaviors that are unlearned, Pavlov also proposed a term for the environmental events that trigger the unlearned response. For example, the loud noise that triggered Bill’s unconditioned startle response is called the

Table 4.1 Unconditioned Responses

Unconditioned responses typically include basic reflexes and certain emotional responses.

Examples

- Salivation
- Fear
- Startle
- Withdrawal
- Eye blink

Unconditioned responses (UCR)

The behavioral response to the unconditioned stimulus without previous learning

Unconditioned stimulus (UCS)

The environmental event that brings about the unconditioned response without previous learning

unconditioned stimulus (UCS). The unconditioned stimulus is defined as the environmental event that brings about the unconditioned response. The unconditioned stimulus and the resulting unconditioned response are the basic elements of classical conditioning. The idea is that through our life experiences we build upon these basic stimulus/response pairs to create the complex behaviors typical of our species. Let’s consider the following example from a fourth grade, language arts class:

Mr. Goodsell is the language arts teacher for a fourth grade class at St. Michael’s School. He has assigned a new project this semester involving the writing of a report on the topic of “social justice.” The project includes a ten-minute presentation. Terrell, a student in the class, was excited about writing the report. He had recently read a chapter in geography about a country where women were not allowed to show their faces in public and thought that it would make an interesting report. In the week before the assignment was due, Terrell worked hard on his report and the presentation. On the day he was to present, he confidently went to the front of the class and gave his report from the podium. His teacher congratulated him on his thoroughness and the class applauded. As he was walking back to his seat, another student leaned over and told him he couldn’t believe he did his report on such a “sissy” topic. Several of the students overheard and laughed quietly. Terrell immediately felt his face flush and his heart beat faster. He tried to say something, but only managed a few halting words. He continued on to his seat and put his head down.

It wasn’t until the following year that Terrell had to make another presentation, this time for his math class. He had to do a report on a prominent mathematician. As before, he dutifully prepared and began to look forward to the presentation. On the day of the presentation, he began to walk to the front of the class, but slowed down as he approached the podium. Although his previous public speaking experience was met with excitement, the excitement was now replaced with a peculiar feeling. His heart was racing, his face felt hot, and he couldn’t remember the first word of his presentation.

Let’s try to interpret Terrell’s situation in terms of classical conditioning. The first step is to identify an unconditioned stimulus/response pair. Terrell’s response following the student’s

remark about his social justice report can be viewed as an unlearned response. Terrell experienced several physiological symptoms, including a racing heart rate and blushing. This is a typical human response to situations that are unexpected or take us off-guard and does not require direct learning. In terms of classical conditioning, the physiological response experienced by Terrell would be the unconditioned response, and the unexpected student remarks would be the unconditioned stimulus.

The next part of the classical conditioning involves the **neutral stimulus (NS)**. The neutral stimulus is something in the environment, which initially has nothing to do with the unconditioned response. In this example, the experience of making a presentation at the podium was initially unrelated to the behavioral response of heart racing or blushing. In other words, the experience of making a presentation from a podium does not naturally elicit a racing heart or blushing.

The neutral stimulus in Terrell's situation is the experience of giving a presentation from the podium and the unconditioned stimulus is the rude remark made by the student. In classical conditioning, the timing of the neutral stimulus (presentation from podium) and unconditioned stimulus (rude remark) are extremely important. In general, for classical conditioning to be effective, the neutral stimulus is introduced prior to the unconditioned stimulus. In Terrell's case, the presentation (neutral stimulus) immediately precedes the unkind remark (unconditioned stimulus). This *pairing* of the neutral stimulus and the unconditioned stimulus is the basis for learning through association and is crucial for the classical conditioning process. Without this pairing, classical conditioning would not occur. For some stimuli, a single pairing of the neutral and unconditioned stimuli can produce learning; for others, multiple pairings are required for learning. In our example, the single pairing of the presentation from the podium and the student's remark and the laughter following were powerful enough to produce learning. We know this because Terrell's next experience with giving a presentation resulted in a new response.

When Terrell went to make his presentation in math, it was clear that he had learned to fear public speaking; whereas, just a year before he looked forward to it. This learned behavioral response, fear of public speaking, is called the **conditioned response (CR)**. Pavlov called this the *conditioned* response because it is the product of learning. The learning occurs through the pairing or association between the neutral stimulus (the first presentation Terrell gave from the podium) and the unconditioned stimulus (the unkind remarks). Their pairing caused an association, whereby the neutral stimulus did not remain neutral. When Terrell began his second presentation, the formally neutral stimulus (giving a presentation from the podium) became a **conditioned stimulus (CS)**, eliciting a new response (racing heart and blushing). The conditioned stimulus is an environmental stimulus that brings about a response through the process of learning, and in this case it is the podium in the math class. Figure 4.2 provides a graphical depiction of Terrell's learning process.

Generalization versus Discrimination

Following the initial discovery of classical conditioning, behavioral scientists turned to the question of how we are able to learn something in one situation and then apply that learning to another similar situation. This transfer of learning came to be known as generalization. **Generalization** is defined as emitting a conditioned response to a stimulus that is similar to, but not exactly the same as, the conditioned stimulus. Through generalization, we extend our learning to situations beyond the context in which they were originally learned. Consider Janelle, a pre-K student at a local childcare center. One day, she was out on the school playground and was about to slide down the slide when a bee stung her leg. Janelle became very upset when this occurred and developed a fear of the slide through classical conditioning. Interestingly, Janelle also refused to go down the slide at her neighbor's house, at the fast-food restaurant down the street, and at the local water park. She even began to display anxiety about using the ladder to go up and down her brother's bunk bed. In this example, Janelle's fear of the slide extended to a number of similar situations. From a classical conditioning perspective, her fear of slides and ladders developed as follows: Initially, the playground slide became a conditioned stimulus, eliciting a conditioned response of fear after being paired with the bee sting (unconditioned stimulus) and the resulting pain (unconditioned response). This learning occurred on the school's playground, and it would seem that it should be limited to

Neutral stimulus (NS)

Something in the environment that initially fails to elicit the unconditioned response

Conditioned response (CR)

The behavioral response to the conditioned stimulus brought about through a learned association

Conditioned stimulus (CS)

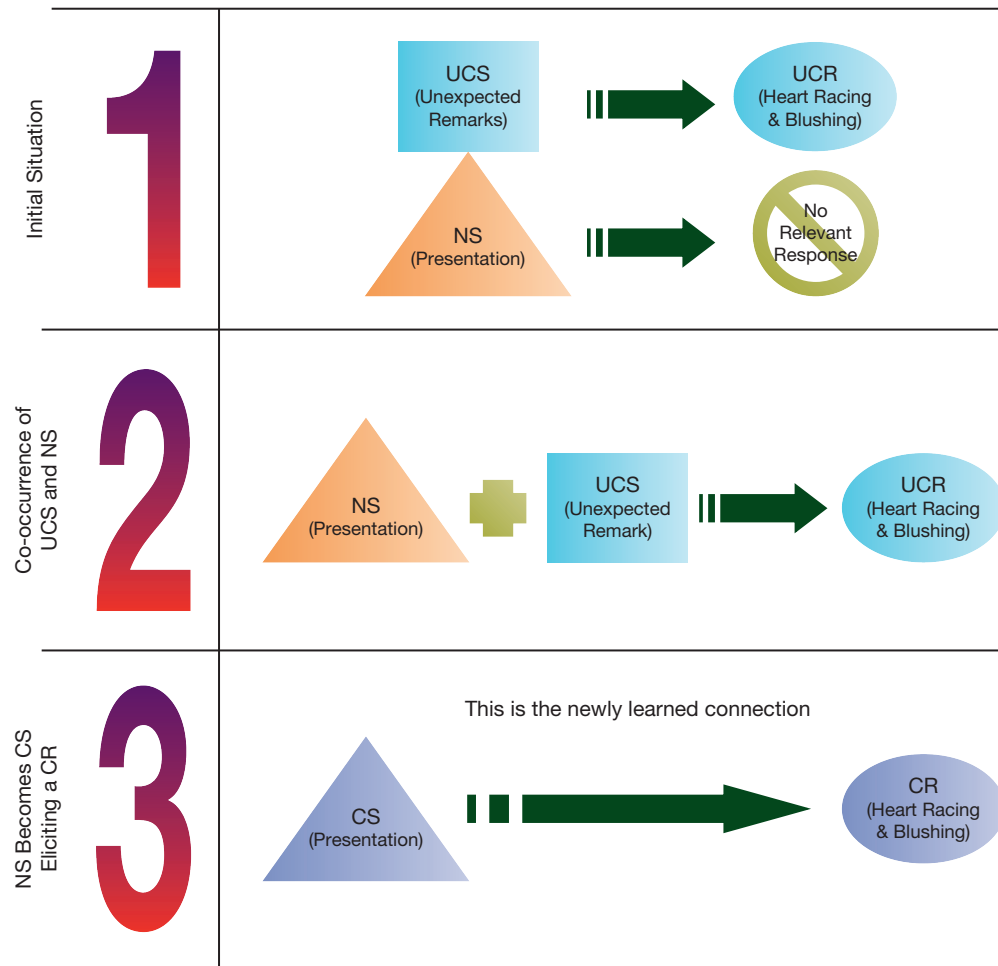
The environmental event that brings about the conditioned stimulus through a learned association

Generalization

A conditioned response to a stimulus that is similar to, but not exactly the same as, the conditioned stimulus

Figure 4.2

Terrell's Learning Process

**LEGEND:**

UCS - Unconditioned Stimulus
 NS - Neutral Stimulus
 CS - Conditioned Stimulus

UCR - Unconditioned Response
 CR - Conditioned Response

Discrimination

Ability to tell the difference between stimuli, allowing someone to limit a conditioned response to the original conditioned stimulus

that particular slide. After all, it is unlikely that all slides and ladders harbor bees. Learning, however, is remarkably flexible.

Janelle learned from her experience at the playground slide and began to *generalize*, or extend, her fear response to other situations. She even went so far as to generalize her newfound fear of the playground slide to any situation where she had to climb a ladder, as demonstrated by her response to her brother's bunk bed. Generalization becomes more likely when there is a high degree of similarity between the learning context and the context in which the learning extends. That is, different looking slides should evoke less fear. Janelle's fear of all slides and ladders indicates a high degree of generalization. Helping her overcome her newfound fear of slides, ladders, and high places will take time and patience. She will need to learn to distinguish between different situations where she is likely to be hurt.

Discrimination involves being able to tell the difference between stimuli, allowing someone to limit a conditioned response to the original conditioned stimulus (Vervliet, Iberico, Vervoort, & Baeyens, 2011). Janelle will need to discriminate, or see the difference between the original playground situation and other similar situations that she encounters. For example, if Janelle only showed a fear response around the slide at school and not around other slides, we would say she is using discrimination. Generalization and discrimination are not necessarily bad or good. Oftentimes, we want students to generalize, applying something they learned to

F.A.Q.

Valerie Schmitt—"Both the UCR and the CR are heart racing and blushing. Are they really the same?"

Professor Rainwater—"The UCR and the CR may look the same, but they differ in that they are preceded by different events. The UCS elicited the UCR (rude remark); however, the CS elicited the CR (presentation). So, you can always tell the difference between the UCR and the CR by looking at what came immediately *before* the response."

other similar situations. For instance, when we teach students to associate learning with enjoyment, we might pair a new learning task with events students naturally enjoy (e.g., games involving physical activity like running, jumping, etc.). We may begin with pairing one learning activity with physical activity (by making it a sort of game) but hope their enjoyment with the current activity generalizes to other learning situations. At other times, we want students to appreciate the differences between situations and behave accordingly. Perhaps we have a student who has developed a fear of math. We would want to intervene and address his fear, but we also want to make sure his fear does not generalize to other classes. Having a basic knowledge of the principles of classical conditioning allows us to examine student learning from a unique perspective, facilitating our ability to create responsive learning environments. By being able to identify the basic elements of classical conditioning in a learning situation, we can examine learning goals and explicitly encourage generalization or discrimination of stimuli accordingly.

Extinction

Once a student has become classically conditioned, is it possible to alter his behavior, so that it returns to pre-conditioning levels? The answer is yes, and it involves the process of **extinction**. Extinction is the elimination of a classically conditioned response. This is accomplished by presenting the *conditioned* stimulus alone, making sure that the *unconditioned* stimulus is not present. Each presentation of a conditioned stimulus without the accompanying unconditioned stimulus weakens the association between the two, resulting in eventual extinction of the classically conditioned response. In the example of Janelle's classically conditioned fear of slides, repeatedly exposing her to slides (conditioned stimulus) while ensuring that she did not come into contact with any stinging insects (unconditioned stimulus) would result in the eventual extinction of her fear response. Similarly, Terrell's classically conditioned fear of public speaking could be extinguished by having him make repeated public presentations, making sure the presentation was not associated with any rude remarks.

Classical conditioning theory was groundbreaking research at the time it was developed. It was quickly heralded as a fundamental building block of learning. Researchers, however, soon learned that it failed to take into account a critical learning factor, consequences. The next section reviews this important issue and how it limits classical conditioning as a complete explanation for learning.

Limitation of Classical Conditioning

Classical conditioning is primarily about a behavior and the earlier event that caused its occurrence. The theory, however, fails to take into account the influence of events occurring *after* the behavior of interest. For example, a third grade teacher was introducing a new math concept. When the teacher called on each of the children to participate in the lesson, she praised those who answered her questions correctly. Could the events occurring *after* the student's response, in this case the teacher's verbal praise, influence learning?

Classical conditioning focuses on the antecedents of behavior and the behavior or response itself. What classical conditioning fails to account for is the influence of consequences, or events occurring *after* the behavior of interest, on future expression of the behavior. Recall Terrell's classically conditioned fear of public speaking. What happened after the students made the rude remarks and Terrell took his seat? Did the teacher notice the situation? Did the teacher give Terrell help interpreting the remarks? Did other students, perhaps a good friend, help Terrell interpret the remark? Any of these possible situations could have had a dramatic effect on Terrell's **acquisition**, or initial learning, of a fear response. Also, remember that all of these possible situations would have occurred *after* Terrell's negative behavioral response (heart racing and blushing).

Research in the behavioral tradition indicates that, in addition to the associative type of learning exemplified in Pavlov's and Watson's classical conditioning, consequences have a strong influence on learning. The next section focuses on learning by consequences and the remarkable work of E. L. Thorndike and B. F. Skinner.

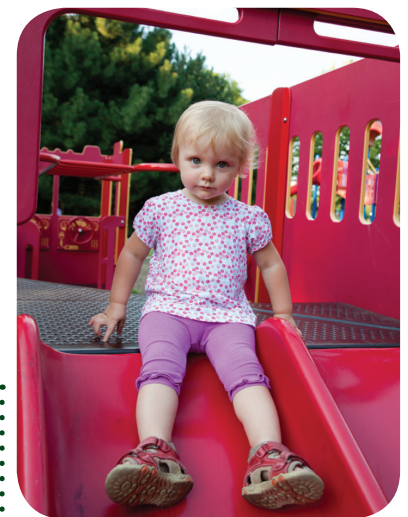
F.A.Q.

John Forsythe—"The NS and the CS also appear to be the same thing. Are they?"

Professor Rainwater—"The NS and the CS both involve the presentation, but at different points in time. The NS is the presentation prior to being paired with the UCS (rude remark). The CS is the presentation after pairing. The CS is distinguished by the fact that it can now do something new, namely, it can elicit heart racing and blushing. It could not elicit this response prior to pairing with the UCS."

Extinction (classical conditioning)

Elimination of a classically conditioned response, typically accomplished by presenting the conditioned stimulus alone



Elimination of a classically conditioned response (such as a fear of slides) is possible through the process of extinction.

Acquisition

The initial learning of a response

SUMMARIZE AND REFLECT

1. Classical conditioning theory began with the work of the Russian physiologist Ivan Pavlov. His initial work on the physiology of digestion led to his discovery of a type of learning, which he called classical conditioning.
2. John B. Watson expanded conditioning theory, further outlining the basic processes involved in classical conditioning.
3. The basic elements of classical conditioning are the unconditioned stimulus, the unconditioned response, the conditioned stimulus, the conditioned response, and the neutral stimulus.
4. In order to produce classical conditioning it is important to pair the unconditioned stimulus and the neutral stimulus.
5. This type of learning can be transferred from one situation to another similar situation, a process known as generalization.
6. Discrimination is when an individual is able to discriminate between stimuli, recognizing that a new stimulus differs from the conditioned stimulus.
7. Extinction is the process of returning a behavior to a level before classical conditioning took place.

INFORMED APPLICATION

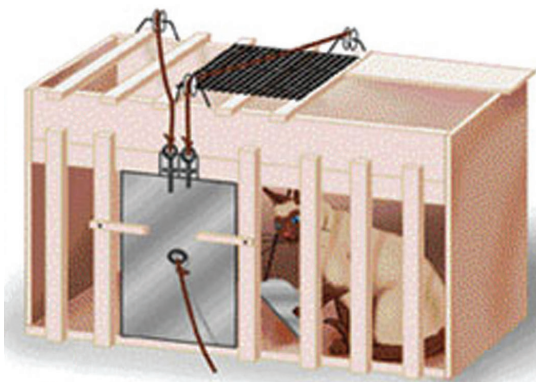
1. Physical education teachers often go to considerable effort to help students enjoy participating in athletic activities. How can you use classical conditioning to help students learn to associate physical education with positive behavioral responses? Identify each of the components of classical conditioning.
2. Students often learn a desirable classically conditioned response in a specific environment (perhaps in traditional classroom environments). How can teachers help students generalize such desirable responses to other situations (art room, study hall, auditorium)?

OPERANT CONDITIONING— LEARNING BY CONSEQUENCE

The second of the three behavioral theories we are covering in this chapter is called operant conditioning. Operant conditioning differs from classical conditioning presented earlier in that it focuses on a different part of the behavioral stream. Recall from the beginning of the chapter that behavior can be viewed as an ongoing stream with earlier events affecting current behavior and current behavior affecting later behaviors. Operant conditioning theorists recognize the importance of this behavioral stream. Their early research, however, was particularly notable for their departure from the stimulus and response focus of classical conditioning. Operant conditioning is a learning theory focusing on how consequences shape the expression of behavior. We will begin with an overview of the earliest work in this area and then review important terminology and applications of the theory.

Law of effect

Principle of behavior stating that a behavior resulting in satisfying events increase the likelihood of that behavior in the future

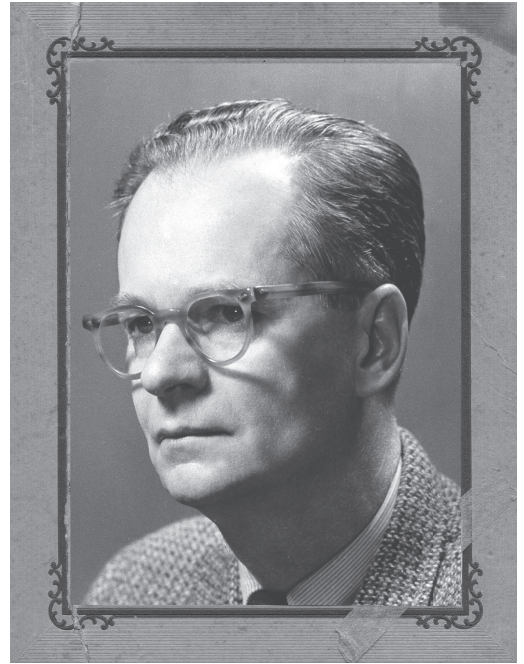


Thorndike and Skinner

E. L. Thorndike pioneered the formal investigation of the effects of consequences on learning (Hilgard & Bower, 1966; Milson, Bohan, Glanzer, & Null, 2010). Through unique studies with cats placed in a “puzzle box,” Thorndike established the power of a satisfying result on the frequency of behavior. In these experiments, the cats had to negotiate a trap door using a string on a pulley. When the cats successfully opened the door, they were able to escape and eat. Cats who successfully completed the task were quicker to solve the “puzzle box” when returned to the box at a later time. The satisfying nature of getting to eat facilitated the cat’s performance on the second trial. Thorndike’s puzzle box research led to the **law of effect**.

This law states that behaviors resulting in satisfying events increase the likelihood of the behavior in the future. The law of effect became the first major principle of consequential learning and laid the foundation for another researcher who would forever change the face of psychology, B. F. Skinner.

B. F. Skinner is one of the most recognized names in psychology primarily because of his groundbreaking research in the 1940s and 1950s. The focus of his research was to extend the learning by association principles established by Pavlov and Watson to include principles related to learning by consequences. He believed that unlike learning by association, which is limited by the number of our innate responses, learning by consequences occurs by an individual operating on the environment in an infinite number of ways. Further, he believed that the consequences of these operations produce changes in our future behavior. This focus on how we operate on the environment and the consequences of these operations led Skinner to define a new theory of learning, which he called **operant conditioning**. Operant conditioning is learning based on how operants (behaviors) are influenced by the consequences that follow (Catania, 1997). For example, Tanya raises her hand frequently in class. From an operant conditioning perspective, she has learned to operate in her environment in this way because of the consequences she receives. Her teacher likely rewards her students by calling on them when they have their hands appropriately raised. While this is a classroom example, Skinner's initial research was far more controlled than the average classroom. He initially investigated the effects of consequences on behavior through the use of a specialized mechanical device called a **Skinner box**. Most of these Skinner boxes were small enclosures, suitable for a rat or pigeon, which included a device that allowed the animal to make a response (lever pressing or key pecking) and a device to deliver a consequence such as a food tray or mild shock (see Figure 4.3). This extremely controlled environment allowed him to specifically examine the effects of environmental consequences on behavior. Largely through his research with animals, Skinner outlined a number of basic behavioral learning principles that went far beyond Thorndike's Law of Effect. Subsequent research by Skinner and others has extended his learning principles to humans in an almost limitless number of situations. We turn now to an in-depth exploration of the basic principles of learning by consequences outlined by Skinner.



► B. F. Skinner

Operant conditioning

A learning theory focusing on how consequences shape the expression of behavior

Skinner Box

Research tool used to investigate the effects of consequences on behavior through the use of a specialized mechanical device

Reinforcer

A favorable outcome occurring after a behavior of interest

Reinforcement

Skinner's research further specified the relation between behavior and consequence. Similar to Thorndike's Law of Effect, Skinner demonstrated that when favorable circumstances follow a given behavior, the behavior would likely continue in the future. He called this process reinforcement. The favorable outcome occurring after the behavior is called a **reinforcer**. For example, Meghan seemed especially well prepared for social studies, so her teacher let her help set up a class group exercise. Assisting the teacher with the group activity (reinforcer) was a pleasant activity for Meghan, reinforcing her excellent class preparation. Skinner's research demonstrated that there are two types of reinforcement.

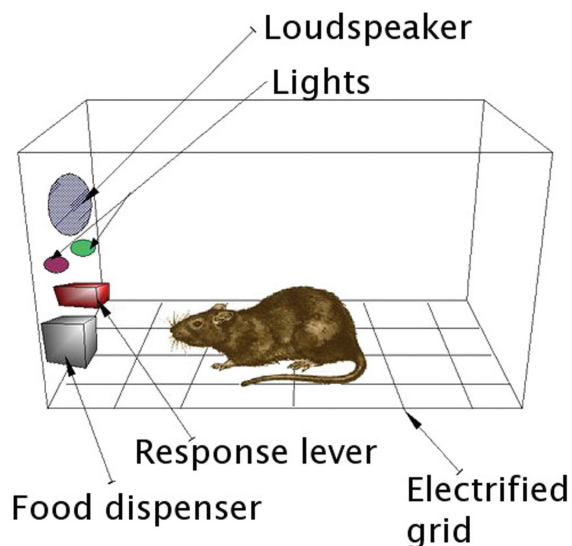


Figure 4.3

Skinner Box

Positive reinforcement

Something positive that is added to the environment in order to increase the frequency of a desired behavior

Negative reinforcement

The removal of something negative from the environment in order to increase the frequency of a desired response

Schedule of reinforcement

The timing and delivery of reinforcement

Continuous reinforcement

Reinforcement that is provided at every instance of a desired behavior

Intermittent schedule of reinforcement

Reinforcement for only some of the desired responses

Positive Reinforcement

This type of reinforcement is called **positive reinforcement** because something positive is added to the environment in order to increase the frequency of a desired behavior. Giving someone something they want as a consequence for behaving in a certain way is a common practice and is easily understood. For example, Rena was presented with a coupon for a free ice cream at a local restaurant because she had perfect attendance during the current marking period. Rena's behavior of attending class was *reinforced* by the coupon, the *reinforcer*—teachers, parents, and employers use this type of consequence with great regularity. Its focus on positive events also serves to make this a particularly favored behavioral management technique. Positive reinforcement, however, is not the only way to *reinforce* someone.

Negative Reinforcement

Skinner demonstrated another type of reinforcement he called **negative reinforcement**. Negative reinforcement is when you remove something negative from the environment in order to increase the frequency of a desired response. Like positive reinforcement, negative reinforcement is accomplished by creating a favorable circumstance. In this case, *removing something negative* or aversive creates the favorable circumstance. Removing something negative from the environment can be very reinforcing. For example, taking away tonight's homework because of excellent classroom behavior is viewed favorably by the students and encourages their good behavior. In this example of negative reinforcement, the reinforcer is the *removal* of the negatively perceived homework. Just as with positive reinforcement, negative reinforcement increases the likelihood of behavior being repeated in the future. Both positive and negative reinforcement encourage behavior. That is, they increase the frequency of behavior in the future. Reinforcement is an important part of behavior, but creating reinforcing situations can be complicated. The next section takes a look at specific ways reinforcers are introduced to an environment to create particular patterns of behavior.

Schedules of Reinforcement

The power of consequences to shape behavior is well documented by a vast collection of experimental research (Baldwin & Baldwin, 1988; Morgan, 2010). It is also well documented that *how* we deliver a consequence can have dramatic impact on the expression of behavior. This has been particularly well documented for positive reinforcement.

Continuous versus Intermittent

The timing and delivery of reinforcement is referred to as **schedule of reinforcement**. For example, reinforcers may be given after every instance of a desired behavior, or they may be given for only some of the desired responses. Reinforcing every instance of a desired behavior is called **continuous reinforcement**. For example, if you gave out extra minutes of recess *every* time a student raised their hand appropriately, you would be using a continuous reinforcement schedule. Reinforcing only *some* of the desired responses is called an **intermittent schedule of reinforcement**. To use this type of schedule you would only give out extra minutes of recess for some appropriate hand raises, perhaps every third one. Although it may appear that continuous reinforcement would result in more of the desired behavior, multiple studies indicate using an intermittent schedule of reinforcement results in more lasting behavioral change (Baldwin & Baldwin, 1988; Grant, 2011).

Intermittent: Ratio versus Interval Schedules

If you wish to use behavior management techniques to achieve lasting behavior change, an intermittent schedule is the appropriate choice. Deciding to reinforce on an intermittent schedule, however, is the easy part. In addition to determining exactly what behavior is going to be reinforced, we also have to decide the following:

- Will we simply count behaviors to determine which ones will be reinforced?

OR

- Will we deliver reinforcement after a certain period of time?

- Will the pattern of reinforcement remain constant?

OR

- Will we vary the pattern we use to reinforce?

First, let's address whether we will reinforce based on *number* of responses or on behavior produced at a particular point in *time*. **Ratio schedules of reinforcement** require reinforcing a certain number of responses. For example, Ms. Belmont is interested in reinforcing students for raising their hands before speaking. She is planning on reinforcing on a ratio schedule and will use a simple verbal reinforcer, "Thank you for raising your hand, [student name], what is your question?" Since she is reinforcing on a ratio schedule, she will be counting each appropriate instance of behavior and providing the verbal reinforcer for a predetermined number of behaviors. She has decided that on the third instance of appropriate hand raising, she will deliver the verbal reinforcer. On non-reinforced instances of appropriate hand raising, she will simply say the student's name. The important point to remember about ratio schedules is that it is based on reinforcement of a certain *number* of responses.

Compare the above ratio schedule to a schedule based on time. **Interval schedules of reinforcement** provides reinforcement for the first instance of a desired behavior following a period of time. This schedule of reinforcement establishes a period of "wait time" during which no reinforcement is possible. After the time period has elapsed, the student is reinforced for the first instance of the desired response. Using the hand raising example, the instructor would first start a timer for a prescribed wait period—let's say three minutes. During the three minutes, the student will not receive any reinforcements for appropriate hand raises. After the timer indicates the three minutes are up, however, the student is reinforced for the first appropriate hand raise they make. Following the reinforcement, the timer is reset and the wait period begins again. The important point to remember here is that interval schedules of reinforcement are based on a predetermined period of *time*.

Ratio schedule of reinforcement

The schedule requiring the reinforcement of a certain number of responses

Interval schedule of reinforcement

A schedule that provides reinforcement for the first instance of a desired behavior after a certain period of time

Intermittent: Fixed versus Variable Schedules

Next, let's answer the question whether the reinforcement schedule will stay the same or will it be periodically changed. Reinforcement schedules that remain constant are called **fixed schedules of reinforcement**. If a teacher were using a ratio schedule and wished to fix the schedule, he would simply set the number of required behaviors and keep this number for the duration of the reinforcement period. Using the hand raising example, he would reinforce only after a predetermined number of hand raises, perhaps three, and always reinforce the third hand raise.

Compare this to a **variable schedule of reinforcement** where the number of hand raises required for reinforcement varies. Using a variable schedule would require the instructor to reinforce an initial number of hand raises, perhaps three, and then to vary the next number of hand raises necessary for reinforcement, perhaps giving the reinforcer after five appropriate hand raises. The number of required hand raises would change after each reinforced hand raise. This variation typically occurs around a predetermined average. If the instructor wanted to variably reinforce around a predetermined average of three, she might initially reinforce for three hand raises, followed by one hand raise, followed by five hand raises. The average of these three variations, $(3 + 1 + 5)/3$, would equal the predetermined average of three.

Fixed and variable schedules of reinforcement also apply to interval schedules of reinforcement. A fixed interval schedule assigns a constant wait period, perhaps three minutes, before reinforcing behavior. A variable interval schedule requires the instructor vary the wait period, perhaps three minutes, followed by one minute, followed by five minutes. Combining the qualities of the ratio and interval schedules with the qualities of fixed versus variable schedules results in four schedules of reinforcement: fixed ratio—FR; variable ratio—VR; fixed interval—FI; and variable interval—VI (see Table 4.2). By convention, we typically denote the intermittent value by placing a number after the above abbreviations. For example, a schedule involving reinforcement after every third response would be called a FR3 schedule. A schedule involving reinforcement after a time period that varies around an average of five minutes would be called a VI5 schedule. Also, keep in mind that these intermittent schedules of reinforcement are simply ways to determine how reinforcers are delivered. The ultimate goal is to promote or encourage some desirable behavior.

Fixed schedule of reinforcement

Reinforcement that is provided at a constant rate

Variable schedule of reinforcement

Reinforcement that varies over time

Table 4.2 Schedules of Reinforcement

Type of Schedule	Description	Characteristic	Overall Category
1) Fixed Ratio	Stable Reinforcement	Reinforcement based on Number	Intermittent
2) Variable Ratio	Changing Reinforcement		
3) Fixed Interval	Stable Reinforcement	Reinforcement based on Time	
4) Variable Interval	Changing Reinforcement		
Reinforce every instance of a desired behavior			Continuous

Using Schedules of Reinforcement to Modify Behavior

When deciding which schedule of reinforcement to use, it is important to realize that different schedules result in different behavior patterns. First, variable reinforcement, either ratio or interval, makes it difficult for students to predict when a reinforcer is going to follow a behavior. At times, it takes relatively few behaviors to get a reinforcer. At other times, numerous behaviors are required before a reinforcer is delivered. The pattern is unpredictable, leading students to engage in desirable behaviors at a fairly steady pace as they try to gain reinforcement. If a steady stream of behavior is desirable, then a variable schedule of reinforcement is the best choice (Parry-Cruwys et al., 2011).

Second, fixed schedules produce a very different behavioral pattern. Under a fixed schedule of reinforcement, students begin to appreciate the regularity of the reinforcement schedule. That is, students are able to predict when they are going to receive reinforcement. A fixed schedule of reinforcement leads to faster initial learning and to an unstable pattern of responses. On a fixed reinforcement schedule, students quickly become aware that they simply have to produce a certain number of responses (fixed ratio) or have to wait a fixed amount of time (fixed interval) before reinforcement is possible. Either schedule will eventually produce a pause after reinforcement. Once students desire another reinforcer in a Fixed Ratio Schedule, or sense that the wait period is about to end in a Fixed Interval Schedule, they will rapidly emit the necessary behavior until a reinforcer is delivered. Students then pause to enjoy the reinforcement, secure in the knowledge of what is needed to get another reinforcer. Teachers who wish to produce rapid student responses often use fixed ratio schedules of reinforcement. Fixed ratio schedules produce rapid learning, but can be problematic because it also results in rapid extinction (elimination of the behavior) when the reinforcers are removed. This problem can be alleviated by carefully changing schedules of reinforcement—starting with a fixed schedule and moving to a variable one.

Scheduling reinforcements is an important part of encouraging desirable behavior. Knowing what types of reinforcement schedules are available and how to implement them effectively gives teachers a valuable set of tools to help them establish an appropriate behavioral climate. Reinforcement, however, is not the only approach to managing behavior. The next section reviews an equally important type of consequential learning.

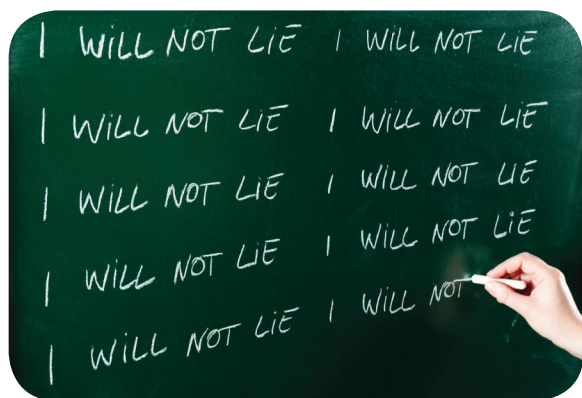
Scheduling reinforcements is an important part of encouraging desirable behavior. Knowing what types of reinforcement schedules are available and how to implement them effectively gives teachers a valuable set of tools to help them establish an appropriate behavioral climate. Reinforcement, however, is not the only approach to managing behavior. The next section reviews an equally important type of consequential learning.

Punishment

Skinner was interested in how to increase the frequency of a desired behavior *and* how to decrease undesirable behaviors. **Punishment** is an unpleasant consequence for a behavior, which decreases the likelihood of the behavior recurring. For example,

Punishment

An unpleasant consequence for a behavior, which decreases the likelihood of the behavior recurring



- Punishment is an unpleasant consequence for bad behavior, which helps decrease the likelihood of the behavior being repeated.

Mary realized that her students were having difficulty working together during a science lesson. After speaking with the class, it became clear the class had become sharply divided over a single comment someone supposedly made the week before. Mary discussed appropriate ways to resolve conflicts between students. She also underscored the importance of not letting such things stand in the way of their education. She set up a reinforcement schedule to address the problem, hoping to encourage cooperative work. After only marginal results, Mary decided to introduce a new consequence, in addition to modifying her reinforcement plan. She decided that any student failing to work in a civil and cooperative manner would have to write a lengthy report on the lesson that day. Mary felt the addition of this punishment was warranted because the student's learning was adversely affected by the disagreements. She also believed the situation had persisted long enough. She carefully chose the nature of her punishment, such that it might also serve as a learning tool. This example shows how educators can use punishment to help guide behavior. Skinner's research actually provided evidence for two types of punishment.

Presentation Punishment

Presentation punishment involves adding something negative to the environment in order to decrease the frequency of an undesirable behavior. For example, Ms. Schilpert has strict rules regarding aggression in her classroom. If any student is caught hitting another student, they are required to write a letter of apology to both the student and the class. All of the students are very uncomfortable about having to write such a letter. The introduction of the letter as a consequence to aggressive behavior is an example of presentation punishment. It adds something to the misbehaving child's environment that would otherwise not be there, and the student views it as an unpleasant consequence.

Presentation punishment

The addition of something negative to the environment in order to decrease the frequency of an undesirable behavior

Removal Punishment

Another type of unpleasant consequence involves the loss of something desirable. This type of punishment is called **removal punishment**. Removal punishment involves removing something from the environment in order to decrease the frequency of an undesirable behavior. This is a fairly common practice in educational settings and includes any removal of privileges as a consequence for unacceptable behavior. Some examples of removal punishment might include losing recess time or the freedom to sit anywhere in the classroom. Both types of punishment, presentation and removal, are summarized in Table 4.3 along with both types of reinforcement, positive and negative.

Removal punishment

The removal of something desirable

Table 4.3 Consequential Learning

Important Components	Environment —Adding or removing something from the individual's environment
	Consequence —viewed as positive or negative by the individual behaving
	Behavioral Change —Behavior is expected to increase or decrease in frequency in the future

Type of Consequence	Definition
Positive Reinforcement	You add something <i>positive</i> to the environment in order to increase the frequency of a desirable behavior
Negative Reinforcement	You remove something <i>negative</i> from the environment in order to increase the frequency of a desirable behavior
Presentation Punishment	You add something <i>negative</i> to the environment in order to decrease the frequency of an undesirable behavior
Removal Punishment	You remove something <i>positive</i> from the environment in order to decrease the frequency of an undesirable behavior

In The Classroom

APPLYING THEORY

Applying Consequences

Students frequently have difficulty identifying operant conditioning processes in complicated, real-life situations. Although the definitions of reinforcement and punishment may seem relatively clear, when one is faced with the actual complexity of real-life behavior, application of the terms is sometimes difficult. Students new to operant theory may find it helpful to follow step-by-step guidelines for identifying operant principles in action. Consider the following scenario:

CLASSROOM EXAMPLE

Mr. Martin is the teacher of a seventh grade math class. While teaching a new concept one day, he notices the students becoming restless and talking among themselves. Unhappy with this behavior, Mr. Martin says to the students that he interprets their restlessness and talkativeness as indication that they already understand the lesson and are becoming bored. He says that since they are bored, they will just move ahead to the test on the material. He moves toward his desk to retrieve the test, and sounds of protest are heard from the students. They begin to complain about the test, claiming that they will fail because they don't know what they are doing. They beg Mr. Martin to reconsider and promise to be more attentive. Mr. Martin looks at them thoughtfully and then agrees to let them out of the exam, smiling to himself at his clever behavior management style. While the students are indeed more attentive during the rest of the math lesson, they exhibit similar inattentive behavior the next day. Mr. Martin again threatens a test, and the previous day's situation is repeated. Later in the week, Mr. Martin makes an appointment with his principal to discuss the behavior of his students. Even after his careful behavior management, his students have become progressively whiny and belligerent, complaining loudly and showing an inappropriate level of distress every time he asks them to do anything.

THEORY APPLICATION

The first step is to identify the behavior of interest. While there are many behaviors depicted in the above scenario, the student's misbehavior is the one of interest. In the passage above, underline the behavior and place a "B" over the relevant words. Next, underline the consequence, which follows the behavior, and place a "C" over the words. The following excerpts illustrate this process.

B "... complain about the test ..." C "... let them out of the exam ..."
--

Now, the next step is to examine the phrase marked "C" and ask the following questions:

1. Was the consequence added to the environment or removed from the environment?
2. Was the consequence viewed as favorable or unfavorable by the person behaving in "B"?

The answer to the first question is that something was *removed* from the environment—in this case, the test. Mr. Martin had previously introduced the exam and was now removing the exam from their day. The answer to the second question is that the consequence was viewed as pleasant. The scenario clearly indicates that the student's viewed the test as aversive. Thus canceling the test was a pleasant consequence. Be careful to answer this second question from the perspective of the person behaving in "B" and not others mentioned in the passage.

(continues)

The final step is to look at the behavior in “B” and ask the question, “Do you expect the frequency of the behavior to increase or decrease in the future?” The answer to this question will depend on whether the consequence was perceived as favorable or unfavorable. Since the students did not want to take the test, its removal was a favorable event. This would lead us to expect the behavior resulting in this favorable event to increase in the future. You now have enough information to determine what type of consequence is represented in the passage. We have a consequence involving the removing of something negative resulting in an increase in the frequency of the behavior, which is the definition of *negative reinforcement* (see Table 4.3).



Teachers should be reflective about how their actions serve as consequences for student actions. How teachers behave potentially shapes the expression of student behavior. Developing a thoughtful, engaged interaction style helps teachers recognize how their actions influence student behavior. This, combined with a thorough understanding of behavioral principles, puts teachers in a more informed position.

Mr. Martin inadvertently reinforced the complaining behavior of his students when he said he would not require them to take the test. He proceeded to engage in this threaten-then-give-in pattern frequently, which explains the progressive increase in his students’ complaining behavior. This behavior management pattern is actually quite common and usually results in the behavioral problems experienced by Mr. Martin.

Shaping and Extinction

Now that you are familiar with the basic processes involved with learning by consequences, let’s take a look at other aspects of this approach to learning. The basic consequences reviewed in the previous section are only the beginning of the whole story of learning by consequences. Everyday learning is grounded in these basic processes, but a more complete understanding necessitates an appreciation of how the basic operant processes interact with other facets of everyday life. In this section, we will take a closer look at the processes of shaping and extinction to illustrate this point.

Teachers often find themselves in the position of wanting to encourage a particular type of behavior. This is difficult, however, if the student never engages in the desired behavior. To encourage the development of a desired behavior that a student never produces, the teacher can use a modified reinforcement approach called shaping. **Shaping** is the reinforcement of progressively closer approximations of a desired response. Using shaping, a teacher would need to catch the student engaging in behaviors resembling the desired response and begin reinforcing those behaviors. If you want a restless student to sit with a learning group, for example, but he never voluntarily sits down, shaping can help. The student will produce a range of behaviors during the learning group, some of which are more related to sitting still than other behaviors. He may not ever sit down and quietly work with his group, yet if his behavior is examined closely, he does engage in some behaviors that are closer to sitting than others. For example, let’s observe the behavior of Matt who will not sit in his chair during group work. Observation indicates that the closest he comes to his group is two feet away, a distance from which he impulsively makes comments to the group. At other times, he is on the other side of the room, about fifteen feet away, and unable to participate at all. From this range of behaviors (two feet to fifteen feet away from the group), his teacher would select the behavior that is most similar to the desired behavior. In this case, his teacher would reinforce his being two feet away from the group. The type of reinforcer would depend on the child, but often simple verbal praise is all that is needed. This will increase the frequency of his being two feet away. In an attempt to be two feet away and achieve reinforcement, Matt will alter his behavioral range, introducing some new behaviors. These new behaviors include moving from about four feet away to standing with the group. The teacher then reinforces a different behavior from this new range that is even more similar to the desired response. As the criteria needed for reinforcement change and closer and closer approximations of actual sitting behavior are reinforced, the range of behaviors Matt produces will eventually include sitting. At this point, his teacher simply reinforces him each time he sits

Shaping

The reinforcement of progressively closer approximations of a desired response

Extinction (operant conditioning)

The process of no longer reinforcing a given behavior

with the group. As you can see, shaping involves the application of operant learning principles in a complicated natural environment.

Another real-life issue involves the modification of behaviors already in existence. **Extinction** is the process of no longer reinforcing a given behavior. This is particularly relevant when the instructor wishes to completely remove the expression of a given behavior, such as issues surrounding student safety. Mr. Scerba is an eleventh grade chemistry teacher and is having trouble with a student following directions. The student frequently begins using laboratory chemicals before he completely explains the assignment. Once, this caused an unexpected chemical reaction, starting a small fire on the student's lab table. Mr. Scerba temporarily suspended the student's laboratory privileges, but he wanted to find another solution. This is an excellent situation in which to apply an extinction paradigm. According to the definition of extinction, Mr. Scerba simply needs to identify the specific reinforcer supporting the student's premature task initiation and then remove the reinforcer. In order to determine the reinforcer, Mr. Scerba reinstates the student's laboratory privileges under strict observation by a teacher's aide. During the observation, the aide notices the student looking about nervously and appearing to repeatedly scan the work area as the instructions were given. A subsequent interview with the student reveals that he experiences severe anxiety regarding the possibility that he will

not be able to finish the lab within the forty-five minute time limit. He further indicates that he feels he is not as smart as the other students and needs to begin before they do, just to keep up. The additional time the student allocated himself by starting early had been reinforcing, in that it had allowed him to finish on time more often than not. Mr. Scerba decided to remove this self-administered reinforcer by allowing the class two periods to complete the lab assignments. Under these new circumstances, the student never started the lab assignment early and appeared to pay more attention during the lab introduction by Mr. Scerba. His increased understanding of the assignment allowed him to handle the laboratory chemicals appropriately. The removal of the reinforcing situation—starting early so that he could finish on time—reduced his unsafe lab behavior to zero. Thus his undesired behavior, starting early, was eliminated without the use of punishment, as Mr. Scerba had hoped.

Extinction is a simple process based on a fundamental principle of operant conditioning: people will not engage in behaviors without reinforcement. When the reinforcement that maintains a behavior is removed, the behavior will eventually extinguish. “Eventually” is an important word here because research shows that use of extinction may initially cause the undesired behavior to increase, rather than decrease. Any increase in behavior following the removal of a reinforcer is temporary. Without reinforcement, the behavior will ultimately cease. Consider the case of Amy, who has just started school. Amy's mother indicates on the first day of school that Amy has a tantrum problem, sometimes lying on the floor and crying for two or three minutes at a time. Amy's teacher knows enough about operant conditioning to know that at home the tantrums likely result in both positive and negative reinforcement for Amy. She is determined to provide no reinforcement at all for tantrum behavior, starting an extinction plan from day one in the classroom. When Amy starts to scream loudly as task demands increase, her teacher continues to work with the other students, telling Amy that when she is ready to participate, she should come right over and join them. Amy proceeds to fall to the floor, kicking her feet and crying. Her teacher continues to work with the other students, ignoring Amy's behavior as best she can. When her behavior does not provide the consequences that it always has in the past, Amy screams and kicks louder than she ever has before. The tantrum continues for a total of eight minutes, far longer than any previous episode. This initial increase in the undesired behavior is characteristic of the initial stages of an extinction plan. After her eight-minute tantrum, Amy settles down, looking curiously at the activity in which her teacher and the other students are engaging. Soon, she stands up, brushes herself off, and joins the group. Amy has several

F.A.Q.

Michael Richmond—“This is the second time in this chapter we have discussed extinction—exactly what are the two types?”

Professor Maxwell—“The first time we encountered extinction was during our discussion of classical conditioning. To extinguish a classically conditioned response you repeatedly present the conditioned stimulus without the unconditioned stimulus. Our current discussion concerns extinction of an operant conditioned response. To extinct an operant conditioned response, you remove the reinforcement supporting the behavior.”

F.A.Q.

Regina Griswald—“It seems like shaping takes an enormous amount of time and effort. Is it really that difficult?”

Professor Maxwell—“Shaping does indeed take significant time and planning. Remember, only use shaping when the student fails to produce the desired behavior. If they already engage in the desired behavior, even infrequently, use reinforcement to encourage the behavior.”

more tantrums in the classroom during the first week of school, but they are progressively much more quiet and of shorter duration. By the second week, the tantrums are successfully extinguished in the classroom, although Amy continues to engage in tantrum behavior frequently at home. This indicates that Amy is able to discriminate between the two different contexts of home and school, tailoring her behavior according to the different reinforcement contingencies present in each environment.

Cueing and Prompting

Learning by consequences emphasizes events occurring after a behavior of interest; however, for maximal learning, it is often productive to consider events occurring *before* the behavior (Mackiewicz, Wood, Cooke, & Mazzotti, 2011).

Cueing is a manipulation of the environment before the behavior of interest. It typically involves changing some part of the classroom environment, such as flashing the overhead lights or ringing a bell. The purpose of providing a cue is to let the students know that you are expecting them to start engaging in a specific behavior, like settling down in their seats to begin a lesson. Another way you can help students know that you want them to behave a certain way is to provide a verbal command, reminding them what the “cue” means. **Prompting** is providing a verbal reminder that a specific behavior is expected. A teacher may say, “I just rang the bell, it is time for you to return to your seats.” It is typical to introduce both a cue and a prompt. Later, a teacher may wish to remove the prompt, using only the cue as the signal for the desired behavior. Consider Kara who is having trouble settling down after morning free time. The teacher has scheduled social studies during this time, and Kara has difficulty finding her seat and getting her work out without explicit instructions from the teacher. The teacher has decided to change the classroom environment just prior to the time when the students are expected to get ready for social studies. First, she takes out a xylophone and puts it on her desk. At the end of free time, she plays the song frequently heard at the beginning of a horse race. She also provides a verbal prompt as an additional measure to help Kara learn to manage her behavior. An appropriate prompt might be, “Free time has ended, please follow the classroom procedures for the next activity.” In this case, the behavior of interest is getting ready for class and the cue was the song on the xylophone. The purpose of cueing and prompting is to give the child a unique stimulus (antecedent) to increase the probability of appropriate behavior. The teacher is likely to continue to administer both the cue and the prompt until the Kara reliably gets ready for social studies. At that time, she should first remove the verbal prompt and just play the song on the xylophone (Alberto & Troutman, 2006). Kara’s behavior may initially become unstable; but with consistent cueing and appropriate consequence, she should again develop a stable and productive pattern of behavior. Over time, the teacher will likely be able to remove the cue and have Kara behave appropriately using only the natural classroom environment to facilitate her behavior.



▶ When reinforcement that maintains tantrum behavior is removed, the behavior will eventually extinguish.

Cueing

A manipulation of the environment before the behavior of interest

Prompting

Providing a verbal reminder that a specific behavior is expected

Applied Behavior Analysis

The behavioral principles reviewed in this section have enjoyed great success in research, educational, and parenting circles. Terms once confined to the research laboratory are now commonly used in the classroom and at home. Before you began reading this section, you probably could have described an example of someone being punished. Similarly, you probably could have described how to reinforce someone for doing well on a test. You are now, however, more knowledgeable about how to provide reinforcement to achieve a particular pattern of behavior. These are all examples of applying behavioral principles. Application of behavioral principles in this way is somewhat informal, but leads us to a discussion of more formal approaches to applying behaviorism.

Applied behavior analysis (ABA) is a professional field that has emerged to address the need for more formal and accountable application of behavioral principles (Alberto & Troutman, 2006). ABA practitioners follow the basic behavioral perspective outlined in this chapter.

Applied behavior analysis (ABA)

A professional field which has emerged to address the need for more formal and accountable application of behavioral principles

That is, they view behavior as occurring in a specific context, with relevant events occurring before and after a behavior of interest. Behavior analysts typically follow a basic procedure for isolating and modifying a behavior of interest:

1. Record baseline information.
2. Identify a target behavior.
3. Implement treatment.
4. Record and review outcome.

Baseline

Record of a behavior of interest prior to any intervention

Treatment

Modifications to the environment in order to produce behavioral change

Performance based

Idea that a treatment professional is concerned with actual behavior and the situational events impacting its expression

This approach begins with recording **baseline information**. This means all relevant information surrounding the behavior of interest is recorded prior to any intervention. Typically, the behavior analyst records events occurring before and after the behavior of interest. This makes it possible for them to determine which antecedents and consequences are contributing to the problem behavior. Once an adequate baseline is recorded, the behaviorist targets a specific behavior for change and develops a working plan or **treatment** for how to modify the behavior. Next, the treatment is implemented. Implementation of the treatment is accomplished through a specific set of steps complete with requirements for recording results. Recording results is an integral and important part of the ABA approach. Proper record keeping allows the behavior analyst to assess the effectiveness of her treatment approach. It also allows for greater accountability, an important topic in today's political climate. The accountability issue will be covered in detail in Chapter 9.

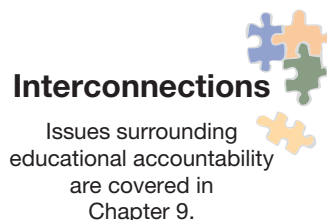
The fundamental approach taken by the behavior analyst described above is supported by several key factors implicit in behavioral work. Sulzer-Azaroff and Mayer (1977) outline four important attributes of ABA. First, the work of the behavior analyst is **performance based**. This means that the behavior analyst is concerned with actual behavior and the situational events impacting its expression. ABA is not concerned with vague or theoretical concepts like "Michael is lazy," or "Sierra is impulsive." Concepts like "lazy" or "impulsive" are too ill defined to be useful to the behavior analyst. What might be lazy to one instructor might be called daydreaming by another. This is why ABA is concerned with the student's actual performance or overt behaviors. For example, Michael failed to complete assignments one, five and seven on February 13 *not* Michael was lazy on these days.

Second, ABA is grounded in the principles of behaviorism. Behavioral principles provide the working tools behavior analysts use to conduct their work. Behavioral principles are effectively applied to a wide range of settings and conditions (Kazdin, 2001; Soorya, Carpenter, & Romanczyk, 2011). Reinforcement and punishment have both been used effectively regardless of gender, age or culture (Wielkiewicz, 1995; Maag, 2001).

Third, ABA is considered "analytic" because it analyzes a given situation and demonstrates how a given behavior is related to events in the environment. Rather than guess about the relation between different behaviors, behavior analysts actually demonstrate the presence of a relation by using the four-step process outlined previously. By systematically applying a well-developed treatment and charting behavioral change, the behavior analyst is able to demonstrate a particular behavioral relation.

Fourth, ABA is an applied field. It is an applied extension of decades of controlled research. It certainly continues to change and evolve from continued research in the area, but it is primarily concerned with the application of behavioral principles in real situations (Bloch & Axelrod, 2008). This, of course, carries with it all the challenges and ethical considerations encountered whenever researched based theories are applied. Behavior analysts are well trained in behavioral principles, but also in ethics, constantly questioning whether their interventions are appropriate.

In conclusion, ABA is a relatively new field, making use of well-established principles of learning. Historically, ABA has been prominent in the treatment of individuals with disabilities, but it is now more widely used. Despite this increase in use and application, the use of behavioral principles has met with criticism. The next section reviews some of the more common criticisms.



Limitations of Operant Conditioning

As the proceeding section demonstrates, operant conditioning helps educators create productive learning environments. Some researchers and educators, however, believe using behavioral principles to manage behavior results in significant problems. Criticisms of behavioral theory take many forms, but are generally about the following issues:

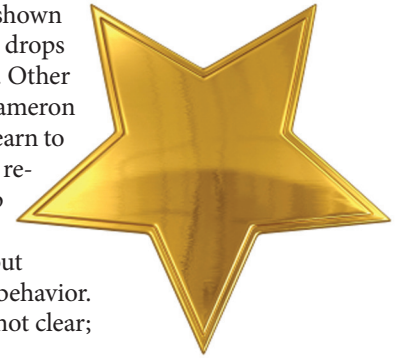
- *Focusing on external control of behavior*
- *Decreasing a student's self-motivated learning*
- *Ignoring the impact of a student's thinking on behavior*
- *Emphasizing good conduct over academic learning*

As any first-year teacher quickly learns, there are far too many students in a typical class to develop a behavior management plan for each one. We rely on most students appropriately managing their own behavior. The question is, do behavior management techniques move a student toward more self-managed behavior? Do students develop a greater need for external control of behavior? The issue here is the ultimate goal of education. Do we want to develop students who rely heavily on external controls to behave appropriately, or do we want to move our students toward self-management of behavior? Most would agree we want to encourage students to manage their own behavior, including their academic behaviors like studying. There are occasions when manipulation of the environment by the teacher is needed to help a particular student in a particular situation, but education is moving toward limiting this type of external control. We are likely to see this trend increase in the future, as teachers are required to implement more individual lesson experiences to our increasingly diverse population.

Learning because it is an enjoyable activity (as opposed to learning for a reward) is something most teachers would like to see in their students. Does external reinforcement, however, decrease one's desire to learn? There has been some debate about this issue. Some studies have shown that although reinforcers can increase the frequency of a behavior, the behavior often drops below pre-reinforcement levels once reinforcement is stopped (Lepper & Hodell, 1989). Other researchers have found reinforcement has little effect on one's natural desire to learn (Cameron & Pierce, 1994, 1996). What does this mean? Researchers have speculated that students learn to behave for the reinforcer under a behavior management protocol. Once the reinforcer is removed, the behavior drops dramatically. This is particularly important because the drop in behavior is to levels lower than existed before the reinforcer was introduced. This means the students used to engage in the behavior for the sake of the behavior itself, but then learned that without being reinforced, they were no longer willing to perform the behavior. The extent to which such findings can be generalized to typical classroom behaviors is not clear; however, teachers are encouraged to be mindful of the potential for this effect.

A third concern regarding the use of behavioral principles is that the approach ignores the potential for a student's thinking to impact their behavior. Consider your own behavior for a moment. Why are you reading this text? Are you being rewarded for your reading behavior? Is someone taking you out to dinner if you finish reading this chapter? What about your thoughts and feelings? Are you reading because you want to learn, you enjoy the material, or you are scared about getting behind in class? Some have criticized behavioral theory because it ignores such internal factors as thinking and emotions. This is particularly striking given education's apparent goal to develop the way to think. Thinking and reasoning will be explored in more detail in the next chapter.

A final point to consider is the tendency for behavioral techniques to emphasize good behavior, rather than learning. Although some behavior programs are designed to achieve an academic goal, often they are designed to modify a specific overt behavior, like aggression. As this chapter demonstrated, behaviorists focus on behaviors we can see rather than internal events, like thinking. It is true that educating in a behaviorally disruptive classroom is not productive; however, do we want to focus education on behaving well? Obviously, we need good behavior *and* good learning to create productive educational environments. The point here is that teachers need to be aware of the possibility of focusing too heavily on overt behavior when using behavior management techniques.



SUMMARIZE AND REFLECT

1. E. L. Thorndike developed the **law of effect**, a principle which holds that behaviors resulting in satisfying results are more likely to reoccur in the future.
2. B. F. Skinner expanded Thorndike's ideas clarifying the effects of both favorable and unfavorable consequences on future behavior.
3. Skinner called learning by consequences **operant conditioning**. Investigation of operant conditioning led to four different types of consequences.
4. These consequences include reinforcement, which increases the likelihood of a behavior, and punishment, which decreases the likelihood of a behavior. These consequences can be further differentiated between positive and negative reinforcement and presentation and removal punishment.
5. There are different schedules for reinforcement delivery, including fixed/intermittent and ratio/interval schedules. Behavioral effects vary depending on which combination of these reinforcement schedules are used.
6. Like classical conditioning, operant conditioning includes the concepts of generalization and extinction. It is also important to be able to recognize the impact of antecedent events in operant learning.
7. **Applied behavior analysis** is an applied field that is based on the principles of behavioral learning theory.

INFORMED APPLICATION

1. Operant learning principles are often discussed in terms of their ability to modify observable behavior. How can the same principles be used to help a student increase their reading comprehension?
2. You want to encourage students to study in a more consistent manner, rather than waiting until the last minute. What kind of reinforcer could you use, and what kind of schedule for delivery would help you achieve your goals?

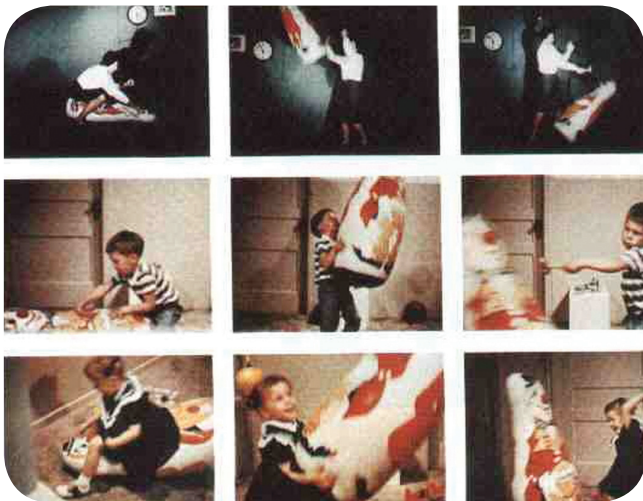
SOCIAL THEORIES: LEARNING BY OBSERVATION

Social interactions play an important role in most of our everyday lives. This section explores whether these social interactions influence learning. As you will see, theorists have proposed that learning by observation of others contributes significantly to the way we behave.

Bandura—Modeling and Observational Learning

Social theories of learning were developed to explain how our social interactions change

learning. For example, social learning theorists study how observation of others impacts our behavior. They also investigate how we use other people as models for appropriate behavior. One of the most prominent of these social learning theorists, Albert Bandura, was particularly interested in the phenomenon of observational learning, which he believed played a central role in human behavior. Observational learning is simply learning by observing others. For example, if you see the teacher tell a friend to stop passing notes in class, you might stop writing notes yourself. Your behavior was changed by observing another student. Bandura developed a program of research designed to outline the principles of learning through observation. In fact, one of his experiments has become one of the best-known research studies in psychology. In this experiment, children observed someone else (a model) showing either aggressive or non-aggressive behavior toward an inflated doll which bounces back when knocked down—the well-



▶ Albert Bandura's "Bobo doll" experiment.

known Bobo doll. Later, the children were allowed to play with the doll. Those exposed to the aggressive model behaved aggressively toward the doll. Those exposed to the non-aggressive model failed to demonstrate an equal level of aggressiveness (Bandura, Ross, & Ross, 1961). This research suggested people learn not only through direct reinforcement and punishment but also by observing others behave. The idea that observational learning does not require direct action or behavior on the part of the learner was a break from prominent behavioral theories at the time. In effect, Bandura differentiated between acquisition of a behavior (learning) and performance (behaving) for the first time. This contradicted the behaviorist notion that learning is understood only through observable events and behaviors. His new conceptualization of learning required exploration of cognitions or thinking (Bandura, 1963) and led to a new area of social theory.

Social Cognitive Theory

Bandura began to redefine behaviorally oriented theories, calling his new approach social cognitive theory (Bandura, 1985). He used this title because of his emphasis on cognitions, or how we think and reason. Many research studies have supported and helped to expand **social cognitive theory**, and a number of basic principles have emerged.

One of the basic principles of social cognitive theory is learning can occur when we observe another's behavior being reinforced or punished. Learning can also occur in the absence of any

apparent reinforcement of a model's behavior. If we observe someone's behavior being reinforced, for example, we are more likely to engage in that behavior ourselves, either immediately or in the future. The behavior might be exactly the same or slightly altered. Eight-year-old CJ, for example, watches Erin as she presents an oral report. Erin uses a cardboard box as a pretend television set, while she acts like an imaginary newscaster. Their teacher, Mr.

Interconnections

Cognitive theories and their application to education are covered in Chapter 5.



Hines, is very impressed with Erin's presentation and openly praises her creativity and originality. The class claps loudly as Erin sits down. CJ, who is scheduled to give his presentation the following day, had been planning to read from note cards. He goes home that afternoon and tells his mother he needs something different and creative, and they look up presentation techniques together on the Internet. The next day CJ's presentation includes a charades component and several physical props. He, too, sits down to praise and applause. Clearly, CJ observed Erin's behavior and changed his own accordingly. In this case, he observed Erin being positively reinforced for her creativity and originality, and tried to capture these qualities in his presentation. This type of learning is easily understood as a form of **vicarious learning**, with the learner being vicariously influenced by the consequences another person received. When you increase a behavior from watching someone else receive reinforcement, we call this a **vicarious reinforcement**. Similarly, when you decrease a behavior because you saw someone receive punishment, we call it **vicarious punishment**.

Bandura believed learning from models involved four key processes (Bandura, 1986):

- *Attention*
- *Retention*
- *Reproduction*
- *Motivation*

The role of attention is quite simple. In order for learning to occur, we have to first notice or *attend* to the behavior of a model. Behaviors and consequences, whether they pertain to ourselves or others, occur around us all the time. Most of these behaviors go unnoticed because we do not direct our attention toward them. We also have to *retain*, or remember, the behaviors we observe in others. Bandura holds that we remember modeled behaviors by mentally representing them. *Reproduction* of modeled behaviors occurs when we call the mentally

Social cognitive theory

Theory emphasizing how social process and thinking impact behavior

Vicarious learning

Learning that is vicariously influenced by the consequences another person receives

Vicarious reinforcement

Increasing a behavior in one participant by watching another receive reinforcement

Vicarious punishment

Decreasing a behavior in one participant by seeing another receive punishment

represented behaviors into action, resulting in imitation of what we observed. Finally, *motivation* determines which behaviors will or will not be reproduced. We not only remember a modeled behavior, we also develop expectations regarding the consequences of that behavior.

This final point regarding expectations leads to another basic principle of social cognitive theory. This theory holds that we develop *expectations* about the reinforcement and punishment we might receive for certain behaviors. These expectations are based on our observations of what happens to others, in addition to our own experiences. CJ, for example, changed his report style after seeing Erin receive positive reinforcement for being creative and original. Did he simply reproduce a behavior he saw reinforced, or did he change his behavior because he *expected* to obtain similar reinforcement? Bandura (1986) proposed we learn from reinforcement and punishment when we understand there is a relation between the modeled behavior and the consequence. Thus, learning involves not just behavior and consequence but also a cognitive link between the two, resulting in an expectation regarding future consequences. These expectations impact the choices we make about our behavior. This differs significantly from the behavioral perspective described earlier in this chapter. The behaviorists saw behavioral predispositions as being driven by a person's history of reward and punishment, factors which are outside one's personal control. What this means is that social cognitive theory goes beyond the basic views of the behaviorists and considers internal thoughts as important factors in determining behavior. We will go into more detail about the importance of thinking in the next chapter, but let's look at one additional topic that has evolved out of the work of the social theorist, self-regulation.

Self-Regulation

Social cognitive theories regarding the impact of thinking on behavior ushered in a renewed interest in how thinking influences the management of our own behavior. This potential capacity to direct our own behavior is called **self-regulation** (Bandura, 1977; Pressley, 1995; Winne, 1995) and has close ties to the observational research of the social theorists. Bandura proposed we observe and reflect on our own behavior. We are constantly evaluating our behavior based on personal standards. These standards derive from our interactions with the world, beginning in the early years of life through our interactions with care givers (Bernier, Carlson, & Whipple, 2010). As we grow and develop, these interactions become internally mediated as we engage in self-reinforcement and punishment, such as "I did a great job and feel proud of myself" or "I failed at this task and feel bad about it." Such internal performance feedback serves to motivate and support behavior, but can also produce negative emotions like anxiety, worry, thought suppression, and fear of negative evaluation. These negative emotions are counterproductive and serve to decrease our sense of self-regulation (Magno, 2010). It is important for students to remember to operate from a positive framework, directing behavior toward relevant goals. Some goals may relate to social activities; others may relate to academics. Achieving goals requires successful management of our behavior.

Self-management

Observational learning has also been shown to play a role in the development of goal states. For example, in one self-reward/modeling study, Bandura (1964) showed that children would evaluate their own behavior and manage their own consequences based on modeled behavior. In this study, children participated in a bowling activity where they could reward themselves with candy. Half the children were exposed to models whose self-rewards were based on a high performance standard, while the other half of the children were exposed to a low performance standard. Those children exposed to the high performance standard model rewarded themselves on a similar high standard criterion; whereas, those exposed to the low performance standard model set lower self-reward criteria for themselves. This shows that we often manage our own behavior by giving ourselves rewards we feel are appropriate. Our standards for what is appropriate are shaped by people we observe.

Self-regulation

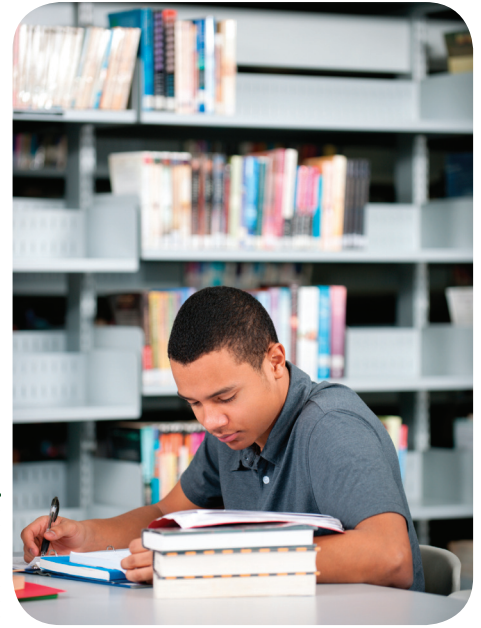
The potential capacity to direct one's own behavior



As we grow and develop we engage in self-reinforcement and punishment such as "I did a great job" or "I failed at this and I feel bad."

Cognitive Behavior Modification

Another approach to modifying our behavior is to use self-management of consequences presented above and add an additional component, a cognitive process. Researchers have found that self-management can be enhanced by altering our thinking about our behavior in addition to managing external factors (Greimel & Kroner-Herwig, 2011). For example, if you are trying to get a student to work on being more consistent with their studying, you might want to establish a self-delivered reward system. You can also look at what the student is thinking about when they attempt to study. What are their goals, expectations, and conceptualization of the task? Teachers might wish to implement the reward program, but adding in a procedure for addressing inappropriate expectations or misconceptions could help produce better results. For example, sometimes students have unrealistic expectations for how long they can reasonably concentrate on homework without a break. Depending on their age, the student who believes they can work productively for ninety minutes straight might be better off studying in thirty-minute sessions. Similarly, students often have an ineffective conceptualization of what studying is supposed to produce. They tend to focus on the upcoming test, rather than simply learning and appreciating the material. Sometimes, helping a student work toward mastery of the material, while minimizing fear of the test, can help the student think about the task in a more productive way.



► Students need to set their goals and estimate how long they can spend on a certain assignment at a reasonable and attainable time.

SUMMARIZE AND REFLECT

1. Social cognitive theory builds on the basic principles of learning outlined by the behaviorists, adding the role of thinking into the learning equation.
2. Albert Bandura is one of the most prominent theorists in the field of social cognitive theory.
3. According to social cognitive theory, people learn by observation and direct experience. What a person learns may not be evident in the individual's actual behavior, indicating learning is represented cognitively.
4. The cognitions people have regarding the relation between behaviors and consequences drive expectations regarding the effects of future behavior.
5. Social cognitive theorists contend that we all think or reflect on the behavioral principles of reinforcement and punishment, implicitly deciding whether a behavior is likely to lead to a good or bad outcome and changing our actions accordingly.
6. The fact that we can choose whether or not to behave in certain ways involves reflection on potential behaviors and consequences. Through self-regulation, we set standards for ourselves and our behavior, work toward these goals, and reinforce or punish ourselves accordingly.
7. This view is a departure from traditional behavioral theory, which holds that we are directed externally by our environments.

INFORMED APPLICATION

1. In between periods, a student comes up to you and asks if he can turn in his research paper that is two days late. The assignment is clearly done and in his hands. What do you do? How will your decision affect the student's future performance? How will your decision affect the other students in the class?
2. Considering observation learning theory, what are some of the advantages of teaching in a group format versus individually? How might group size affect advantages of teaching in a group format?

THE CHAPTER

IN REVIEW



In this chapter, we explored the behavioral perspective on learning, which began with Ivan Pavlov's discovery of classical conditioning. We traced the development of behavioral theory first through the work of John Watson, discussing in detail the basic processes in classical conditioning. We outlined the relative roles of the unconditioned stimulus, the unconditioned response, the conditioned stimulus, and the conditioned response in this form of learning. We also discussed generalization and discrimination in classical conditioning, focusing on the application of these processes in education. Next, we turned to the work of B. F. Skinner, who further developed the behavioral perspective of learning with his extensive research regarding the role of consequences in learning. We outlined a number of basic principles of learning discovered by Skinner, defining consequences which increase the likelihood of a behavior recurring (positive and negative reinforcement) and consequences which decrease the likelihood of a behavior recurring (presentation and removal punishment). We then explored Skinner's research on the timing and presentation of conse-

quences, outlining the characteristic behavioral responses produced by different reinforcement schedules (intermittent/fixed, ratio/interval). Finally, we turned to the social theorists, most notably Albert Bandura, who eventually brought internal mental events in the form of cognitions, or thinking, back into the learning equation. We highlighted Bandura's proposal that we can learn from models, as well as how he used words such as expectations and self-reflection in combination with behavioral principles. We also discussed how Bandura's work suggests we have a choice regarding whether or not to behave in certain ways, in that we can think about, or reflect on, potential behaviors and consequences. In summary, while we may or may not purposely choose to use the principles of learning presented in this chapter in our teaching, having this knowledge allows us to examine the learning context from a unique perspective, potentially increasing our ability to create effective learning environments.

Interdisciplinary Case Focus

principal *special educator*
teacher *parents* *psychologist*
social worker *physical educator*
nurse *peers* *doctor*



It's Kathy Coolidge's first year teaching third grade, and it is the third week of school. She had been so excited about finally having her own class, and everything

started out beautifully. While it took a week to establish her authority, most of the students responded well to her classroom structure and discipline. Brent, however,

continues to disrupt the class all too frequently. In fact, his behavior is getting worse, despite her attempts to consistently let him know that his disruptions will not be tolerated. Initially, he made noises, spoke without raising his hand, and randomly bothered the other students. Kathy calmly explained the rules to him each time, outlining the consequences for continued disruption. Brent had to be separated from the other children a few times during the second week, when he was so obnoxious during small group work that the other children could not benefit from instruction. This week he has started disrupting the class almost every time Kathy tries to have them engage in a focused activity, such as reading group. It is only Tuesday, and Brent has been sent to the office three times. The thing that is so difficult to understand is that during unstructured times or independent seatwork, Brent is relatively quiet. He also seems to pay attention and participate appropriately during math time. Kathy doesn't want the principal to think that she can't control her class, so she doesn't want to continue to send Brent to the office. She is also concerned about his learning—he misses much of what she tries to teach. When she works with him one-on-one, he responds well, but he needs frequent repetition of directions and cueing regarding what to do next on a given assignment. Records from Brent's previous school indicate slightly below average academic skills. Recognizing that she needs more information than the sketchy records Brent's previous school provided, she sets up an afternoon meeting with his parents. She also seeks advice from another more experienced teacher at her school regarding her problems with Brent. Finally, she sends an e-mail to her classroom discipline teacher from college, asking for any insight she might have regarding the situation.

Parents Brent's parents are astounded that Brent is causing trouble in class. His mother says that she never once had even a note come home from school regarding his behavior. In fact, she says that during his second grade parent/teacher conferences, his teacher usually remarked how quiet he was in class. The only problem ever mentioned regarding Brent's behavior was that he would not speak in front of the rest of the class. His second grade teacher said she understood he was shy, so she had not pushed him; however, his lack of participation was a constant factor. Brent's parents were also astounded that his teacher saw him as shy. They said he is not shy at all at home or in other structured activities, such as sports; they see these school reports of shyness or behavior problems as totally out of character for him.

Jack Kline, fourth grade teacher Jack Kline is a fellow teacher and has years of experience teaching elementary school children. After listening to Kathy's situation, he tells her she should consider the possibility

Brent might have some language based learning problems that are just beginning to show up. Jack said since Brent's behavior during math is not consistent with his behavior in other subjects, it could be a red flag that something might be going on related to reading or language. He said he has taught several children who have significant reading problems, but actually excel at math. He also said the fact that Brent only disrupts during group work, together with his previous teacher's reports of his difficulty speaking in front of others, suggests he is trying to avoid an interactive type of learning environment. This could be because he is embarrassed about not really knowing what's going on or not being able to meet task demands. Jack suggests Kathy conduct an informal assessment regarding Brent's language skills and reading comprehension and consider referring him for testing if the results indicate significant weaknesses.

Professor Paul Hopkins, Classroom Discipline Instructor, South State University Professor Hopkins' e-mail reply to Kathy's explanation of her situation was as follows:

Hi Kathy,

I can probably sum this situation up for you in two words: avoidance learning. Remember negative reinforcement involves having something that you don't like removed from the environment as a function of a behavior. It sounds like when Brent misbehaves, the consequence is that he gets out of an unpleasant situation. In other words, removal from the group may not be a punishment for Brent but rather negative reinforcement. Now, I can't tell you why working in a group would be unpleasant for this child, but I can speak with some certainty as to the power of avoidance learning. Let me know if I can be of further assistance—I am confident that you will be successful in figuring this out.

Good luck,

Dr. Hopkins

Wrapping It Up

Kathy reflected on Brent's behavior in new ways after her interactions with his parents, Mr. Kline, and Dr. Hopkins. The e-mail from Dr. Hopkins was quite enlightening. She remembered avoidance learning, and she knew all about reinforcement and punishment. She had not, however, been looking at Brent's behavior from a behavioral learning principles perspective. As soon as she read the e-mail, she thought, "Of course!" She immediately stopped using removal from the group as a consequence. She sat down with Brent and talked with him about his behavior in group activities. She told him she really wanted him in the group and was going to stop removing him from the group

or sending him to the office when he became disruptive. She then started an extinction based strategy, whereby she gave no response when he made disruptive noises. Initially, Brent got even louder, but he quickly began to show decreases in his disruptive behavior. Kathy also made sure she only directed simply stated questions toward Brent during group work, in case Mr. Kline was right about his language functioning. She did conduct an informal assessment of Brent's language and reading skills and found he had significant difficulty following multi-step directions, making sense of complex sentences, and comprehending what he read. His decoding skills were pretty good, so she thought that his reading problems might be related to a

larger language processing problem. She referred him for testing, and her assessment of his problems were right on target. He had significant receptive language problems, which the speech language pathologist said were most significant under conditions of complex language interchange, such as group work. Brent began receiving speech/language therapy twice a week, and Kathy consulted with his therapist regarding ways of accommodating his problems in the classroom. She began providing him with bulleted, step-by-step instructions when directions were complex. Kathy's classroom quickly became exactly what she had been hoping for as a first year teacher—an exciting and supportive community for learning.

Key Terms

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