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**Educational Psychology
Theory and Practice
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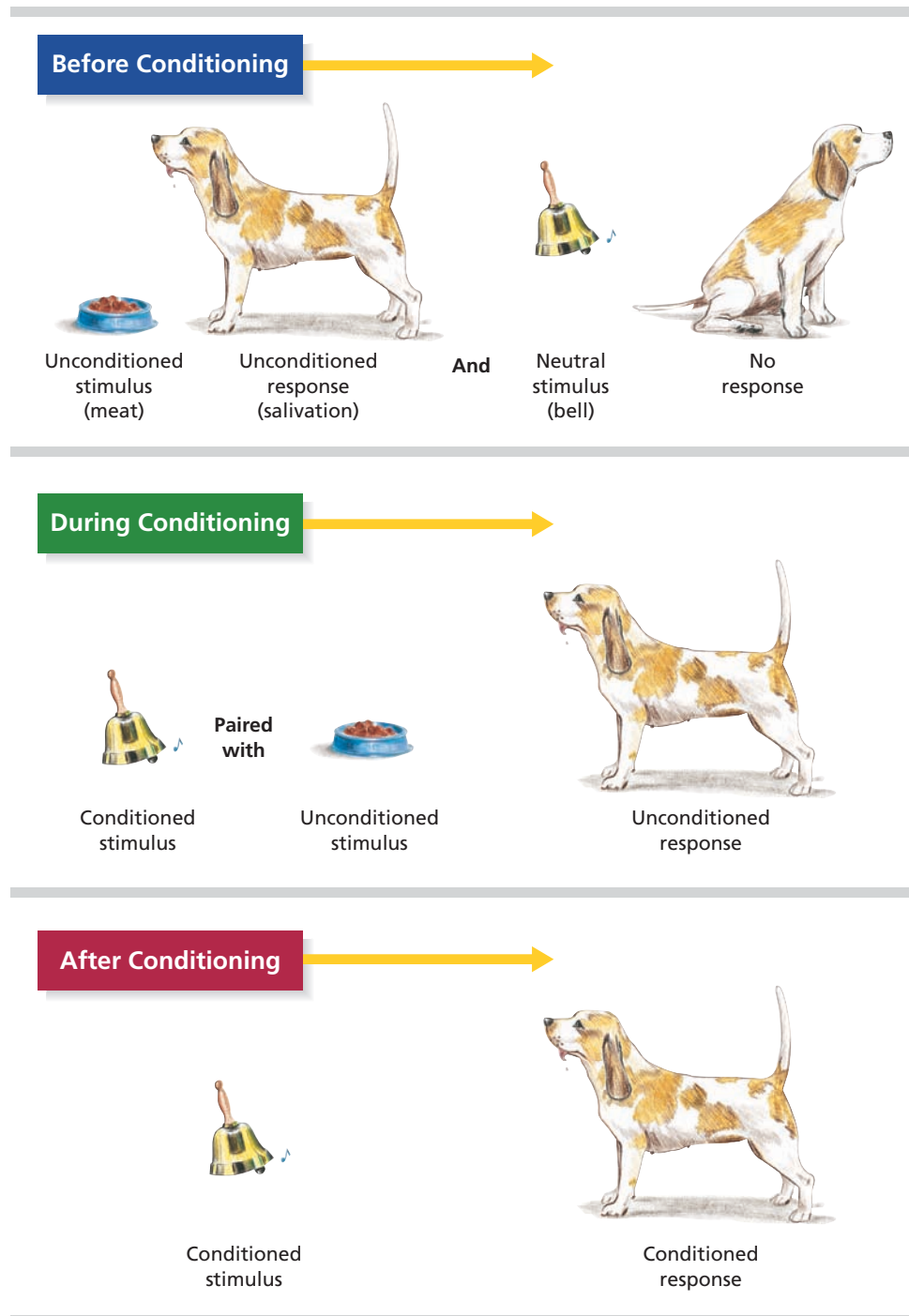
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FIGURE 5.1 Classical Conditioning

In classical conditioning, a neutral stimulus (such as a bell) that at first prompts no response becomes paired with an unconditioned stimulus (such as meat) and gains the power of that stimulus to cause a response (such as salivation).



operant conditioning

The use of pleasant or unpleasant consequences to control the occurrence of behavior.

Skinner box

An apparatus developed by B. F. Skinner for observing animal behavior in experiments of operant conditioning.

consequences, the individual will engage in that behavior more frequently. The use of pleasant and unpleasant consequences to change behavior is often referred to as **operant conditioning**.

Skinner's work focused on placing subjects in controlled situations and observing the changes in their behavior produced by systematic changes in the consequences of their behavior (see Alberto & Troutman, 2009; Bigge & Shermis, 2004; Malott, 2008). Skinner is famous for his development and use of the **Skinner box**, a device that contains a very simple apparatus for studying the behavior of animals, usually rats and pigeons. A Skinner box for rats consists of a bar that is easy for the rat to press, a food dispenser that can

give the rat a pellet of food, and a water dispenser. The rat cannot see or hear anything outside of the box, so all stimuli are controlled by the experimenter.

In some of the earliest experiments involving Skinner boxes, the apparatus was first set up so that if the rat happened to press the bar, it would receive a food pellet. After a few accidental bar presses, the rat would start pressing the bar frequently, receiving a pellet each time. The food reward had conditioned the rat's behavior, strengthening bar pressing and weakening all other behaviors (such as wandering around the box). At this point, the experimenter might do any of several things. The food dispenser might be set up so that several bar presses were now required to obtain food, or so that some bar presses produced food but others did not, or so that bar presses no longer produced food. In each case the rat's behavior would be electronically recorded. One important advantage of the Skinner box is that it allows for careful scientific study of behavior in a controlled environment (Bigge & Shermis, 2004). Anyone with the same equipment can repeat Skinner's experiments.



ON THE WEB

The B. F. Skinner Foundation website at www.bfskinner.org aims to improve the understanding of human behavior through the work of B. F. Skinner.



Most teacher certification tests will require you to know that when a teacher reinforces a student who raises her hand to speak, she is using operant conditioning.

consequences

Pleasant or unpleasant conditions that follow behaviors and affect the frequency of future behaviors.

reinforcer

A pleasurable consequence that maintains or increases a behavior.

What Are Some Principles of Behavioral Learning?

Behavioral learning theory has its own language to describe how consequences of behavior shape later behavior (also see Alberto & Troutman, 2009; Bigge & Shermis, 2004; Kazdin, 2001; Malott, 2008; Walker, Shea, & Bauer, 2004).

■ The Role of Consequences

Skinner's pioneering work with rats and pigeons established a set of principles of behavior that have been supported in hundreds of studies involving humans as well as animals. Perhaps the most important principle of behavioral learning theories is that behavior changes according to its immediate **consequences**. Pleasurable consequences strengthen behavior; unpleasant consequences weaken it. In other words, pleasurable consequences increase the frequency with which an individual engages in a behavior, whereas unpleasant consequences reduce the frequency of a behavior. If students enjoy reading books, they will probably read more often. If they find stories boring or are unable to concentrate, they may read less often, choosing other activities instead. Pleasurable consequences are called *reinforcers*; unpleasant consequences are called *punishers*.

■ Reinforcers

A **reinforcer** is defined as any consequence that strengthens (that is, increases the frequency of) a behavior. Note that the effectiveness of the reinforcer must be demonstrated. We

How does this Skinner box work? What type of conditioning is the rat undergoing? How does that type of conditioning take place, and how is it different from the type of conditioning Pavlov studied?



Nina Leen/Time Life/Getty Images

Teachers are a primary source of reinforcement in children's lives. What type of secondary reinforcement is this teacher demonstrating? What are the possible outcomes of this reinforcement?

David Lassman/Syracuse Newspapers/The Image Works



cannot assume that a particular consequence is a reinforcer until we have evidence that it strengthens behavior for a particular individual. For example, candy might generally be considered a reinforcer for young children, but after a big meal a child might not find candy pleasurable, and some children do not like candy at all. A teacher who says, “I reinforced him with praise for staying in his seat during math time, but it didn’t work,” may be misusing the term *reinforced* if there is no evidence that praise is in fact a reinforcer for this particular student. No reward can be assumed to be a reinforcer for everyone under all conditions (Barnhill, 2005).

PRIMARY AND SECONDARY REINFORCERS Reinforcers fall into two broad categories: primary and secondary. **Primary reinforcers** satisfy basic human needs. Some examples are food, water, security, warmth, and sex. **Secondary reinforcers** are reinforcers that acquire their value by being associated with primary reinforcers or other well-established secondary reinforcers. For example, money has no value to a young child until the child learns that money can be used to buy things that are themselves primary or secondary reinforcers. Grades have little value to students unless their families notice and value good grades, and families’ praise is of value because it is associated with love, warmth, security, and other reinforcers. There are three basic categories of secondary reinforcers. One is social reinforcers, such as praise, smiles, hugs, or attention. When Ms. Esteban recognized Rebecca, she was inadvertently giving Rebecca a social reinforcer: her own attention. Other types of secondary reinforcers are activity reinforcers (such as access to toys, games, or fun activities) and token (or symbolic) reinforcers (such as money, grades, stars, or points that individuals can exchange for other reinforcers).

POSITIVE AND NEGATIVE REINFORCERS Most often, the reinforcers used in schools are **positive reinforcers** that include praise, grades, and stars. However, another way to strengthen a behavior is if its consequence is an escape from an unpleasant situation or a way of preventing something unpleasant from occurring. For example, a parent might release a student from doing the dishes for completing homework. If doing the dishes is seen as an unpleasant task, release from it will be reinforcing. Escapes from unpleasant situations are called **negative reinforcers** (Landrum & McDuffie, 2008).

primary reinforcer

Food, water, or other consequence that satisfies a basic need.

secondary reinforcer

A consequence that people learn to value through its association with a primary reinforcer.

positive reinforcer

Pleasurable consequence given to strengthen behavior.

negative reinforcer

Release from an unpleasant situation, given to strengthen behavior.

This term is often misinterpreted to mean punishment, as in “I negatively reinforced him for being late by having him stay in during recess” (Martella, Nelson, & Marchand-Martella, 2003). One way to avoid this error in terminology is to remember that reinforcers (whether positive or negative) strengthen behavior, whereas punishment is designed to weaken behavior (see Table 5.1).

THE PREMACK PRINCIPLE One important principle of behavior is that we can promote behaviors by making access to something desirable contingent on doing something less desirable. For example, you might say, “As soon as you finish your work, you may go outside” or “Clean up your art project, and then I will read you a story.” These are examples of the **Premack Principle** (Premack, 1965), sometimes called “Grandma’s Rule” from the age-old statement, “Eat your vegetables, and then you may play.” You can use the Premack Principle by alternating more enjoyable activities with less enjoyable ones and making participation in fun activities depend on successful completion of the less enjoyable ones. For example, in elementary school it may be a good idea to schedule music, which most students consider an enjoyable activity, after a difficult subject so students will know not to fool around during the difficult subject and risk losing part of their desired music time (Martella et al., 2003).

TABLE 5.1 Consequences in Behavioral Learning

Strengthens Behavior	Discourages Behavior
<p><i>Positive Reinforcement</i> <i>Example:</i> Rewarding or praising</p>	<p><i>No Reinforcement</i> <i>Example:</i> Ignoring</p>
<p><i>Negative Reinforcement</i> <i>Example:</i> Excusing from an undesirable task or situation</p>	<p><i>Removal Punishment</i> <i>Example:</i> Forbidding a desirable task or situation</p>
	<p><i>Presentation Punishment</i> <i>Example:</i> Imposing an undesirable task or situation</p>



Teacher certification tests are likely to require you to know that when a teacher says, “If you get an A on tomorrow’s test, you won’t have to do homework the rest of the week,” she’s using negative reinforcement (escape from an unpleasant consequence, assuming homework is unpleasant!).

Theory into Practice

Classroom Uses of Reinforcement



The behavioral learning principle most useful for classroom practice is also the simplest: Reinforce behaviors you wish to see repeated. This principle may seem obvious, but in practice it is not as easy as it appears. For example, some teachers take the attitude that reinforcement is unnecessary, reasoning, “Why should I reinforce them? They’re just doing what they’re supposed to do!”

Guidelines for the use of reinforcement to increase desired behavior in the classroom are as follows (see Alberto & Troutman, 2009; Jones & Jones, 2004; Kauffman, Mostort, Trent, & Hallahan, 2002; Malott, 2008; Marzano, 2003; Miltenberger, 2001).

1. Decide what behaviors you want from students, and reinforce these behaviors when they occur. For example, praise or reward good work. Do not praise or reward work that is not up to students’ capabilities. As students begin a new task, they will need to be reinforced at every step along the way. Close approximations of what you hope to accomplish as a final product must receive positive feedback. Break down new behaviors (classroom assignments) into smaller parts and provide adequate rewards along the way.

2. Tell students what behaviors you want; when they exhibit the desired behaviors and you reinforce them, tell them why. Present students with a rubric that itemizes the criteria you will use when evaluating their work and include the point value for each criterion. Students then will be able to discriminate their own strengths and weaknesses from the feedback they receive from you.

INTASC

4 Multiple Instructional Strategies

Premack Principle

Rule stating that enjoyable activities can be used to reinforce participation in less enjoyable activities.

3. Reinforce appropriate behavior as soon as possible after it occurs Delayed reinforcement is less effective than immediate reinforcement. When you are grading an assignment, present feedback to your students as soon as possible. It is important that students know how they are doing in class, so don't delay their grades. When constructing an assignment, you should always consider the grading scheme that you will use and how long it will take you to provide the intended feedback.

INTRINSIC AND EXTRINSIC REINFORCERS Often, the most important reinforcer that maintains behavior is the pleasure inherent in engaging in the behavior. For example, most people have a hobby that they work on for extended periods without any reward. People like to draw, read, sing, play games, hike, or swim for no reason other than the fun of doing it. Reinforcers of this type are called **intrinsic reinforcers**, and people can be described as being intrinsically motivated to engage in a given activity. Intrinsic reinforcers are contrasted with **extrinsic reinforcers**, praise or rewards given to motivate people to engage in a behavior that they might not engage in without it. There is evidence that reinforcing children for certain behaviors they would have done anyway can undermine long-term intrinsic motivation (Deci & Ryan, 2002). Research on this topic finds that the undermining effect of extrinsic reinforcers occurs only in a limited set of circumstances, in which rewards are provided to children for engaging in an activity without any standard of performance, and only if the activity is one that children would have done on their own without any reward (Cameron & Pierce, 1994, 1996; Eisenberger, Pierce, & Cameron, 1999). Verbal praise and other types of feedback are extrinsic reinforcers that have been found to increase, not decrease, intrinsic interest. What this research suggests for practice is that you should be cautious about giving reinforcers to children for activities they would have done on their own. However, for most school tasks, which most students would not have done on their own, there is no basis for concern that use of extrinsic reinforcers will undermine intrinsic motivation, especially if those reinforcers are social and communicate recognition of students' growing mastery and independence. In fact, it has been argued that failure to use positive reinforcement when it would have been effective in increasing positive behaviors is unethical (e.g., Bailey & Burch, 2005; Maag, 2001). For example, consider a student who is at risk of being expelled due to fighting. If a program of positive reinforcement for avoiding fighting might have eliminated the student's fighting, then you would be ethically bound to try such a plan (or others) before considering such a serious step as expulsion.



ON THE WEB

For a debate on the issue of intrinsic versus extrinsic motivation, visit www.restud.com/PDF/intrinsicresfeb4.pdf.

intrinsic reinforcers

Behaviors that a person enjoys engaging in for their own sake, without any other reward.

extrinsic reinforcers

Praise or rewards given to motivate people to engage in behavior that they might not do otherwise.

Theory into Practice

Practical Reinforcers



Anything that children like can be an effective reinforcer, but there are obvious practical limitations on what should be used in classrooms. One general principle