

FOCUS ON VOCABULARY AND LANGUAGE

Learning breeds hope. The fact that we can change and adapt as a result of experience (*learn*) in so many different areas gives rise to optimism (*breeds hope*) about our future prospects. The study of **learning** has played an important role in psychology and is one of its core subdisciplines (no topic is closer to the heart of psychology).

How Do We Learn?

. . . watching a TV character get *mugged* . . . To be *mugged* means to be attacked, (sometimes) beaten, and robbed. This example shows how associations are formed between events—such as between the sounds that precede an attack and the mugging itself. In movies and on TV, a certain type of music is often played before a frightening event or scene. After a few such associations, the music itself can elicit fear before you actually see the frightening or scary event. This is an example of a type of **associative learning** known as **classical conditioning**.

. . . the clever [Japanese] *rancher* outfitted his *herd* with *electronic pagers*, which he calls from his cell phone. In this conditioning example, the cattle farmer (*rancher*) has trained his animals (steers or cattle, the *herd*) to gather together and move to the feeding station (*the food trough*). The animals have learned to associate the sound of the tone (*the beep*) made by the signaling device (*the electronic pager*) with the delivery of food (**classical conditioning**). They have also learned that moving fast (*hustling*) to the food container (*the trough*) is followed by the good feeling of satiated hunger (**operant conditioning**).

Classical Conditioning

For many people, the name Ivan Pavlov (1849–1936) rings a bell. Myers is making a little joke here. A common expression when hearing something familiar but vague is to say, “*That rings a bell.*” Pavlov’s name is familiar to many people, who may also be vaguely aware that his research involved dogs and ringing bells (*classical conditioning*).

Pavlov’s Experiments

. . . what the dog was thinking and feeling as it *drooled* . . . To *drool* means to salivate or produce spit. When food (the **US**) is placed in a dog’s mouth, the dog will automatically salivate or drool (the **UR**). If a tone (the **NS**) is sounded before (*precedes*) the US over a number of trials, then the NS (the tone) becomes a **CS**, which by itself will elicit salivation (the **CR**). Note that before conditioning, the tone is a **neutral stimulus (NS)** because it does not elicit the target response of salivation. The basic classical conditioning procedure does not require knowledge of the dog’s cognitions. Pavlov decided that the dog’s internal mental state (*what the dog was thinking and feeling*) was not important in reaching an understanding of fundamental learning principles. Rather, focusing attention on cognitive processes only led to futile arguments (*fruitless debates*).

They [the male quail] developed a *preference* for their cage’s *red-light district* . . . Traditionally, a red lamp hung in the window identified a house as a brothel, and the area of town populated by many brothels became known as the *red-light district*. In Domjan’s experiments with male quail a red light (the NS) was used to signal (*herald*) the arrival of a receptive female quail (the US), which elicited sexual arousal (the UR). Eventually, the red light (now the CS) alone elicited sexual arousal

(the CR), and the male quail appeared to develop a general liking (*preference*) for the cage with the red light (*the red-light district*).

(*Retrieval Practice*) If the *aroma* of cake baking *sets your mouth to watering*, what is the US? The CS? The CR? When you bake a cake in the oven, there is a lovely smell (*aroma*), which makes you salivate or drool (*sets your mouth to watering*). This is an example of classical conditioning. The taste of the cake in your mouth is the US, which automatically produces saliva (the UR). The *aroma* is the CS and, because of its past associations with the US, it can now, by itself, elicit saliva (the CR).

Confronted by a guard dog, *your heart may race*; confronted by a guide dog, it probably will not. Guard dogs are generally perceived as aggressive and potentially dangerous; guide dogs are usually gentle and friendly. Thus, when you encounter a guard dog, you may experience physiological arousal (*your heart may race*) and you may experience fear. The sight of a guide dog will not likely cause the same reaction. To be able to tell the difference (*discriminate*) between two stimuli (in this case, two types of dogs) is an adaptive ability that has obvious survival value.

Pavlov's Legacy

But if *we see further* than Pavlov did, it is because we *stand on his shoulders*. This phrase is not to be taken literally. It simply means that we now know more than Pavlov did (*we see further*) because we can build and expand on his great work (*stand on his shoulders*).

Former drug users often feel a *craving* when they are again in *the drug-using context*—with people or in places they associate with previous *highs*. For those who are attempting abstinence, the strong desire (*craving*) for a drug may be a classically conditioned response (a CR) to the sight or presence of people or places (CSs). These people or places (CSs) were associated with taking the drug (the US), which produced the UR (euphoric feelings or *highs*). Drug addicts are therefore advised to avoid (*steer clear of*) settings related to their previous drug-taking activity (*the drug-using context*) that might elicit (*trigger*) these intense needs (*cravings*).

Operant Conditioning

Skinner's Experiments

. . . *to pull habits out of a rat*. Myers is having fun playing with the English language here. The expression “*to pull rabbits out of a hat*” refers to stage magicians who are able to extract rabbits from a seemingly empty hat. Can you see the way Myers has twisted this expression? Both classical and **operant conditioning** involve teaching new habits to various organisms, including rats. Following classical conditioning, the CS triggers a new response from the animal (that is, the CS *pulls a habit out of the rat*). Or, following operant conditioning, the sight of the lever may elicit the habit of lever pressing. Skinner's research on learning has been very important and has done much more than simply demonstrate how the **acquisition** of habitual behaviors occurs (*how habits are pulled out of a rat*).

They [pigeons] have even been trained to discriminate between *the music of Bach and Stravinsky* (Porter & Neuringer, 1984). *Bach* and *Stravinsky* were composers whose styles of musical composition were quite different. Through **shaping** (rewarding behaviors that are closer and closer to the target, or desired, response), psychologists have been able to train pigeons to *discriminate* (choose) between the two musical sounds. For example, pigeons may be rewarded for pecking a disk

when *Bach* is playing and for refraining from pecking when *Stravinsky* is playing. By giving or withholding rewards, they can be trained to *discriminate*, or tell the difference, between the two.

Or consider a teacher who *pastes gold stars on a wall chart* after the names of children scoring 100 percent on spelling tests. Teachers often use extrinsic rewards or reinforcers such as small, bright stickers (*gold stars*), and typically display them on a classroom bulletin board (*paste them on a wall chart*) for, say, the very best spellers in the class. Unfortunately, if only the top few students (*the academic all-stars*) are recognized in this way, the rest of the students may lose motivation because, even if they improve their spelling and work very hard (but still don't score 100 percent), they won't receive any reinforcers (*gold stars*). Myers suggests that it might be better if teachers were to use a *shaping* procedure that rewards even small improvements and recognizes the child for making the effort to do better and better.

. . . and pushing the *snooze button* will silence your annoying alarm. When your alarm goes off in the morning, you may press the switch (*the snooze button*), which turns off the irritating tone for a brief period of time. The ensuing quiet period, which may allow you to go back to sleep for a while (*snooze*), and the absence of the alarm are **negative reinforcers** for pushing the snooze button. (Your button-pushing behavior has been strengthened because it removed an aversive event, the alarm.) Likewise, a regular drug user (*a drug addict*) may be negatively reinforced for continuing or resuming drug taking because doing so diminishes the pain associated with going without the drug (*withdrawal pangs*).

. . . *goofing off and getting a bad exam grade* . . . Students may score poorly on an exam because they were doing something unproductive, such as watching TV, instead of studying (they were *goofing off*). As a consequence, they may decide to change their behavior and work hard to avoid further exam anxiety and the unpleasant possibility of getting a low grade. The new behavior may be strengthened if it avoids the aversive consequences of anxiety (**negative reinforcement**). In addition, getting a good score on the exam can **positively reinforce** good study habits. Remember, reinforcers of either kind (positive or negative) always strengthen behavior.

Salespeople do not make a sale with every *pitch*. The *pitch* referred to here is the sales talk (*pitch*) that the salesperson uses to promote the product or service. The idea is that much of our behavior is not continuously reinforced but persists, nevertheless, by being partially, or intermittently, reinforced (the salesperson makes a sale only once in a while, despite using the sales *pitch* many times). Thus, **intermittent reinforcement** encourages the expectation of future reinforcement (*hope springs eternal*). Further, it creates greater resistance to **extinction** of the behavior compared with a **continuous reinforcement** schedule.

. . . *fly fishing* . . . This refers to a style of fishing in which artificial insects, such as flies, are used as bait to catch fish. People who *fly fish* (*fly-casting anglers*) are reinforced only once in a while, despite making many responses. This **variable-ratio schedule** of reinforcement makes the target behavior very persistent and hard to suppress (the behavior is very resistant to *extinction*) because ultimately the more responding, the more reinforcement.

. . . *a choppy stop-start pattern* . . . When reinforcement is for the first response after a set time period (*a fixed-interval schedule*), responding is typically more frequent as the expected time for the reinforcer gets closer (*draws near*) and is much less frequent after the reward has been received. The pattern of responding is consequently uneven (*choppy*) because cycles of post-reinforcement pauses followed by higher levels of responding (*a stop-start pattern*) are characteristic of the fixed-interval schedule.

Like the message that finally rewards persistence in rechecking for e-mail or a Facebook response . . . E-mails can arrive at unpredictable times. If you are expecting a response from someone, it is best to check online every once in a while. This type of slow, steady responding, typical of a **variable-interval schedule**, may be reinforced with the message that you have received a reply.

. . . *drawbacks* . . . These are problems or bad consequences. One problem (*drawback*) with using **punishment** is that the behavior may be temporarily suppressed in the presence of the punisher, but may reappear in other, safer settings. In addition, punishment may elicit aggression, create fear and apprehension, and generate avoidance behavior in those being punished. As Myers notes, *punishment tells you what not to do; reinforcement tells you what to do*.

No wonder *spanking is a hit* with so many U.S. parents of 3- and 4-year-olds . . . The word *hit* has a number of meanings. It can mean to physically strike someone or something (as in “to *hit* a ball”), but it can also mean to be popular (as in “to be a *hit*”). Parents who physically punish (*hit* or *swat*) their young children are negatively reinforced for doing so if the children’s bad behavior is suppressed or eliminated. It is not surprising then that *spanking* (*hitting* or *swatting*) is popular (*is a hit*) with so many parents.

Which is the chicken and which is the egg? The old question, “*Which came first, the chicken or the egg?*” implies that it is not always clear what is *cause* and what is *effect*. Studies show a correlation between physical punishment (*spanking*) and risk for aggression (and depression and low self-esteem). However, some critics note that correlations do not provide cause-and-effect answers (*Which is the chicken and which is the egg?*). Perhaps preexisting tendencies (such as aggression) elicited stricter or harsher punishment than might otherwise be the case, rather than the other way around.

Skinner’s Legacy

. . . *stirred a hornet’s nest* . . . A *hornet* is a large yellow and black stinging insect belonging to the wasp family. Up to 200 *hornets* live together in a sheltered home (*a nest*). If the *nest* is disturbed or agitated (*stirred*), the *hornets* will attack in an angry and aggressive manner. B. F. Skinner aroused a great deal of anger and hostility and was vehemently attacked by many people (*he stirred a hornet’s nest*) for insisting that mental events and free will (*internal thoughts and feelings*) were of little relevance as determinants of behavior when compared with environmental factors such as rewards and punishments (*external influences*).

Stand in Skinner’s shoes for a moment . . . Pretend that you are Skinner (*stand in his shoes*). You observe teachers whose students vary in ability from highly competent learners (*whiz kids*) to *slow learners*. *Whiz kids* find it relatively easy to understand math concepts (they *breeze through* them), but *slow learners* find the concepts more difficult. Skinner’s idea was to have individualized instruction matched to each student’s ability level, something that is now feasible through interactive student software, web-based learning, and online testing.

Biology, Cognition, and Learning

Biological Constraints on Conditioning

. . . *piggy bank* . . . This is a small container for saving money (usually coins) that is often in the shape of a *pig*. Children can learn to save their money by putting it in their *piggy bank*. However, as Myers points out, pigs that were trained to put big wooden coins in a large *piggy bank* soon reverted

to their natural behavior of pushing the coins with their noses (*snouts*)—despite the fact that they received no reward for doing this. This example of *instinctive drift* illustrates the biological constraints on learning.

Cognition's Influence on Conditioning

So, even in classical conditioning, it is (especially with humans) not simply the CS-US association but also *the thought that counts*. The expression “*it's the thought that counts*” recognizes that a person's intentions and motivations (*thoughts*) are just as important as his or her actual behavior. Myers is making the point that cognitions (*thoughts, perceptions, expectations*) are now viewed as being critically important to the process of learning through classical conditioning. For example, in therapy, people with alcohol dependence may be given a drink that has had a drug added to make the drinker sick (*alcohol spiked with a nauseating drug*). Awareness that the drug induced the sickness *weakens* the association between drinking alcohol and feeling nausea (*the thought counts*).

Promising people a reward for a task they already enjoy can *backfire*. If children enjoy doing something because it is fun (*intrinsic motivation*), they may lose interest in the task if they are promised a reward for it (*extrinsic motivation*). Thus, in some circumstances, offering material gains (a reward or *payoff*) may have an effect opposite to the one expected (it can *backfire*). However, properly applied rewards can motivate high performance levels (*they fuel your efforts*), increase and promote (*spark*) creativity, and enhance enjoyment of tasks. They can also raise (*boost*) feelings of competence, especially if they suggest (*signal*) that a job was well done.

Learning by Observation

Compared with children not exposed to the adult model, those who viewed the model's actions were more likely to lash out at the doll. Bandura's experiments on **observational learning** demonstrated that children who saw an adult engage in (*model*) violent behavior (*an aggressive outburst*) were more inclined to attack and beat up (*lash out at*) a Bobo doll. In addition, they were more likely to copy (*imitate*) the words and gestures used by the adult.

Mirrors and Imitation in the Brain

. . . *flabbergasted* . . . Giacomo Rizzolatti and his team of researchers were amazed and astonished (*flabbergasted*) when they accidentally discovered (*stumbled onto*) a previously unknown type of neuron, now called a **mirror neuron**, in the monkey brain. The activity of these neurons provides a neural basis for empathy, imitation, and observational learning. Though humans have brains that support empathy and imitation, researchers are still debating whether it is mirror neurons or distributed brain networks that give humans this ability. But as Myers notes, regardless of who wins the debate, “children's brains enable their empathy and their ability to infer another's mental state, an ability known as *theory of mind*.”