CHAPTER 5

Learning

I. Classical Conditioning: Learning Signals and Associations

1. **Classical conditioning** is a procedure in which a neutral stimulus is paired with a stimulus that elicits a reflex or other response until the neutral stimulus alone elicits a similar response. Organisms learn the relationships and associations between stimuli. (see Pavlov’s Discovery)

   Example: Cat owners who feed their cats canned food and use an electric can opener know that just the sound of the opener will cause the cat to come running into the kitchen and salivate. The sound of the opener (an originally neutral stimulus) is paired with food (a stimulus that elicits a reflexive response such as salivation or other behavioral responses such as running into the kitchen) until the sound alone elicits the response. This occurs because the sound of the electric opener predicts the presence of food.

2. An **unconditioned stimulus (UCS)**, in classical conditioning, is the stimulus that elicits a response without conditioning or learning having to take place. (see Pavlov’s Discovery)

   Example: In the cat example in Key Term 2, food is the unconditioned stimulus; it naturally causes the cat to salivate.

   Remember: Unconditioned means “unlearned.” Cats do not have to learn about food every time in order to respond to food.

3. An **unconditioned response (UCR)**, in classical conditioning, is the automatic or reflexive response to the unconditioned stimulus. (see Pavlov’s Discovery)

   Example: In the cat example in Key Term 2, salivation is an unconditioned response. This behavior or response is reflexive or unlearned and occurs in the presence of the unconditioned stimulus (food).

4. A **conditioned stimulus (CS)**, in classical conditioning, is the stimulus that, only after repeated pairings with the unconditioned stimulus, causes a conditioned response that is similar to the unconditioned response. (see Pavlov’s Discovery)

   Example: In the cat example in Key Term 2, the sound of the can opener is the conditioned stimulus because it initially elicited no response from the cat (as a neutral stimulus). Only when the sound of the opener was paired with the presentation of food did the sound predict the presence of food (UCS) and cause the cat to run to the kitchen and salivate.

   Remember: Conditioned means “learned.” The conditioned stimulus is originally neutral; the organism must learn that it predicts the presence of the UCS.

5. A **conditioned response (CR)**, in classical conditioning, is the learned response elicited by the conditioned stimulus. (see Pavlov’s Discovery)

   Example: In the cat example in Key Term 2, the cat’s response of running to the kitchen and salivating when it hears the can opener is the conditioned response.
6. **Extinction**, in classical conditioning, occurs when the conditioned stimulus, after being presented without the unconditioned stimulus, loses its predictive value. Eventually, the conditioned stimulus no longer elicits the conditioned response. In operant conditioning, a response is extinguished when it is no longer reinforced. (see Conditioned Responses over Time: Extinction and Spontaneous Recovery)

*Example:* The story “The Boy Who Cried Wolf” is an example of extinction in classical conditioning. Shepherds learned that hearing someone cry “Wolf!” (CS) meant that a wolf (UCS) had appeared, and consequently they would run (CR) for help. When one little boy repeatedly cried “Wolf!” for no reason, the other shepherds stopped responding (CR) to his cry (CS) because it no longer predicted the presence of a wolf (UCS).

*Remember:* To become extinct means to “no longer exist.” In the above example, the CR (running) no longer exists when the cry of “Wolf!” (CS) is heard.

7. **Reconditioning**, in classical conditioning, refers to the repairing of the CS and the UCS after extinction has taken place. During reconditioning, an organism learns more quickly than it did the first time that the CS predicts the UCS. (see Conditioned Responses over Time: Extinction and Spontaneous Recovery)

*Remember:* Conditioning involves the association of two stimuli such that one (CS) begins to predict the occurrence of the other (UCS). Reconditioning is simply repeating this process.

8. **Spontaneous recovery** is the reappearance of the conditioned response when the CS is presented after extinction in the absence of reconditioning. (see Conditioned Responses over Time: Extinction and Spontaneous Recovery)

*Example:* Pavlov’s dogs were conditioned to salivate (CR) in response to the sound of a bell. After extinction (hearing the bell without receiving food), the dogs no longer responded. If, after a long time following extinction, the dogs heard the sound of the bell again, they would most likely salivate. The conditioned response would have spontaneously recovered.

*Remember:* Spontaneously means “suddenly” or “without planning.” In spontaneous recovery, the CR occurs suddenly or immediately after only one presentation of the CS (bell).

9. **Stimulus generalization**, in classical conditioning, occurs when an organism displays a conditioned response to a stimulus that is similar, but not identical, to the conditioned stimulus. In operant conditioning, several different but similar stimuli can inform an organism that, if a particular response is made, a reinforcer or punishment will be presented. (see Stimulus Generalization and Discrimination)

*Example:* Nguyen was very curious as a child. He had never seen a spider (CS) before the time he picked up a big reddish-brown one to investigate it closely. Eventually, the spider bit him (UCS), causing him to become ill (UCR) for several days. Nguyen is now an adult and avoids (CR) all spiders, not just reddish-brown ones. He is reacting to stimuli that are similar, but not necessarily identical, to the original conditioned stimulus (reddish-brown spiders).

10. **Stimulus discrimination** occurs when an organism learns that stimuli similar, but not identical, to the conditioned stimuli do not predict the occurrence of the unconditioned stimulus. (See Key Term 22 for more information about discrimination in operant conditioning.) (see Stimulus Generalization and Discrimination)

*Example:* Raoul the dog receives an injection (UCS) at the veterinarian’s every four months. Raoul usually loves to ride in the car. However, whenever his owner drives Raoul to the veterinarian’s (CS), Raoul whimpers (CR) for most of the ride. Raoul has learned to discriminate between the route to the veterinarian’s and the route to other places.
11. **Second-order conditioning** occurs when a new neutral stimulus is associated with a conditioned stimulus and itself comes to produce the CR in the absence of the CS. (see The Signaling of Significant Events)

   *Example:* If Pavlov had turned on the light in the room before ringing the bell (CS) and the dogs eventually began to salivate (CR) as soon as he turned on the light, second-order conditioning would have occurred.

   *Remember:* Second-order conditioning means that there is a second conditioned stimulus.

12. **Habituation** occurs when we learn not to respond to a repeated stimulus. A new stimulus often grabs our attention and earns a response; after a while, though, the new stimulus is not new and we no longer respond to it. (see Some Applications of Classical Conditioning)

   *Example:* Shelley just received a large diamond engagement ring from her boyfriend. After the first two weeks of wearing it, Shelley notices how it feels on her hand and looks at it often. After a while, though, Shelley becomes habituated to the feel and look of the ring and no longer notices it as much or as often.

**II. Instrumental and Operant Conditioning: Learning the Consequences of Behavior**

13. The **law of effect** holds that if a response made in the presence of a particular stimulus is followed by a reward, that same response is more likely to occur the next time the stimulus is encountered. Responses that are not rewarded are less and less likely to be performed again. (see From the Puzzle Box to the Skinner Box)

   *Remember:* The law of effect means the law of being effective. If an organism learns that a behavior produces a desired effect, such as good grades or money, the organism will repeat the behavior. If the behavior is ineffective (it doesn’t produce anything, or it produces bad effects, such as a scolding), it will not be repeated.

14. Instrumental conditioning or **operant conditioning**, is a procedure during which an organism learns that certain responses are instrumental in producing desired effects in the environment. (see From the Puzzle Box to the Skinner Box)

   *Example:* Most students have learned that studying (response) results in receiving good grades (desirable effects).

15. An **operant** is a behavior that, in operant conditioning, brings about a consequence in an organism’s environment. (see Basic Components of Operant Conditioning)

   *Remember:* Operant responses are behaviors that operate on the world in some way.

16. A **reinforcer** is anything that increases the likelihood that a behavior will be repeated. Reinforcers can be positive or negative. (see Basic Components of Operant Conditioning)

17. **Positive reinforcers**, in operant conditioning, are rewards. If presented following a behavior, they increase the likelihood of that behavior’s future occurrence. (see Basic Components of Operant Conditioning)

   *Example:* If Rover gets a bone (a positive reinforcer) every time he rolls over, he will probably roll over frequently.

   *Remember:* A reinforcer always encourages the repetition of the behavior that it follows. A pleasant stimulus (+) is added (+) to the environment. You can remember this by thinking that a positive number times a positive number yields a positive number.
18. **Negative reinforcers**, in operant conditioning, are unpleasant stimuli that, if removed following a behavior or response, will increase the likelihood of that behavior's future occurrence. (see Basic Components of Operant Conditioning)

*Example:* Hunger pains are unpleasant stimuli. Eating causes them to go away. People learn the habit of eating when they experience hunger pains because the pains disappear (negative reinforcers).

*Remember:* A reinforcer always encourages the repetition of the behavior that it follows. In negative reinforcement, a negative stimulus (–) is subtracted from (–) the environment. You can remember this by thinking that a negative number times a negative number always yields a positive number.

19. **Escape conditioning** occurs when an organism learns that a particular response will terminate an aversive stimulus. (see Basic Components of Operant Conditioning)

*Example:* Lydia has recently set up a computer at home and now does most of her work there. Her cat, Spooky, has begun to sit next to the terminal and cry until Lydia gets up to feed him. Lydia has learned that her response of feeding the cat will remove the distracting sound of his cries.

*Remember:* Escape and avoidance conditioning are sometimes confused. In order for escape conditioning to occur, the organism must first be in trouble.

20. **Avoidance conditioning** occurs when an organism responds to a signal in a way that prevents exposure to an aversive stimulus. (see Basic Components of Operant Conditioning)

*Example:* Leslie has learned that by accepting most men’s invitations for dates, she avoids the awkwardness of explaining that she is not interested in them.

*Remember:* Escape and avoidance conditioning can be confused. In avoidance conditioning, the organism avoids ever getting into trouble. In escape conditioning, the organism learns how to get out of trouble.

21. **Discriminative stimuli**, in operant conditioning, are signals to an organism that, should a particular response be made, reinforcement is available. Such a response is said to be under stimulus control because the response is usually made when only the discriminative stimulus is present. (see Basic Components of Operant Conditioning)

*Example:* Alicia knows that her business partner is in a good mood if she is smiling, is not wearing her suit jacket, and has opened the blinds. These discriminative stimuli inform Alicia that she can approach her partner with a new idea (Alicia’s particular response) and expect her partner to be supportive (reinforcement). Alicia’s behavior is under stimulus control because Alicia will not approach her partner unless the discriminative stimuli are present.

22. **Shaping** is an operant conditioning process in which successive approximations of a behavior are reinforced until the entire desired behavior pattern appears. (see Forming and Strengthening Operant Behavior)

*Example:* Trainers at Sea World want to teach a whale to jump through a hoop. Since wild whales do not normally perform this behavior, the trainers must shape it. They might begin by rewarding the whale for jumping out of the water. Then they reward the whale for jumping toward a hoop and eventually for touching it. Each of these behaviors is a successive approximation of jumping through a hoop. Eventually, the entire behavior pattern will be learned and rewarded.

*Remember:* To **shape** means to “mold into something.” In shaping, the behavior must be gradually molded.
23. **Primary reinforcers** are inherent rewards. Thus, learning that the reinforcement is positive is not necessary. (see Forming and Strengthening Operant Behavior)

*Example:* Food and water are primary reinforcers if you are hungry.

24. **Secondary reinforcers** are those rewards that have acquired meaning by their association with primary reinforcers. (see Forming and Strengthening Operant Behavior)

*Example:* Before people used money in exchange for goods, they worked to produce or exchange life’s basic necessities, such as food. Because it allows people to buy food and has therefore become associated with food, money is a secondary reinforcer.

25. The **partial reinforcement extinction effect** occurs when a partial reinforcement schedule has been used in the operant conditioning process. The more difficult it is for the organism to predict the occurrence of reinforcement (meaning the behavior isn’t rewarded every time), the harder the response is to extinguish. (see Forming and Strengthening Operant Behavior)

*Remember:* To extinguish an operant behavior, reinforcement is no longer given following a response. On a partial reinforcement schedule, an organism will have to perform a response more than once or wait for a period of time before realizing that responses are no longer being rewarded. An animal on a continuous reinforcement schedule can know after only one response that reinforcement has been withdrawn.

26. **Punishment** is the presentation of an aversive stimulus, which decreases the frequency of the immediately preceding response. (see Punishment)

*Example:* For people who want to break their nail-biting habit, there is a fingernail polish with a bad taste. When people wearing this polish bite their nails, they are punished with an aversive stimulus (the taste of the polish). This is done to decrease the behavior (nail biting) immediately preceding the taste.

*Remember:* Punishment has several side effects.

### III. Linkages: Networks of Learning

### IV. Cognitive Processes in Learning

27. **Learned helplessness** occurs when an organism believes that behaviors are not related to consequences. (see Learned Helplessness)

*Example:* Children may develop learned helplessness if they find that no matter how much or how little they try to learn, failing grades always result. At that point, they may no longer feel that it is worth trying to achieve at school.

*Remember:* Organisms learn to be helpless.

### V. Focus on Research: The “I Can’t Do It” Attitude

28. **Latent learning** is learning that is not demonstrated at the time that it occurs. (see Latent Learning and Cognitive Maps)

*Example:* You discover that you enjoy your psychology class. However, you do not demonstrate the knowledge that you learned during the first lecture until the first test several weeks later.

*Remember:* Latent means “not visible.” What you have learned is not visible until a later time.
29. **Cognitive maps** are mental representations of the environment. (see Latent Learning and Cognitive Maps)

   *Example:* When he was at college, Dale lost his sight in a car accident. When he got out of the hospital, he still knew how to get around the campus because he had a mental representation (or cognitive map) of the campus.

30. **Insight** is the sudden grasp of new relationships that are necessary to solve a problem and that were not learned in the past. (see Insight and Learning)

31. **Observational learning** occurs when people learn by watching others’ responses. Learning takes place even if others’ responses are not rewarded. (see Observational Learning: Learning by Imitation)

   *Example:* Suppose you found a being from another planet on your doorstep. Charlie the alien is intelligent and looks just like a human being. That night, Charlie watches you brush your teeth. Then he picks up the toothbrush and imitates your behavior. This is not because he knows you get great checkups at the dentist. He is merely learning a behavior by watching you do it.

32. **Vicarious conditioning** occurs when an organism learns the relationship between a response and its consequences (either reinforcement or punishment) by watching others. (see Observational Learning: Learning by Imitation)

   *Example:* Tara is the youngest of six children. By watching her brothers and sisters, she learns which behaviors her parents reward and which behaviors they punish.

**VI. Thinking Critically: Does Watching Violence on Television Make People More Violent?**

**VII. Using Research on Learning to Help People Learn**