

Chapter 6: Learning

6.1 How Do We Learn?

- Learning: a relatively enduring change in behavior, resulting from experience
 - Nonassociative learning: responding after repeated exposure to a single stimulus or event
 - Repeated exposure to a single stimulus
 - Associative learning: linking two stimuli, or events, that occur together
 - Develops through conditioning
 - Observational learning: acquiring or changing a behavior after exposure to another individual performing that behavior
- Habituation: a decrease in behavioral response after repeated exposure to a stimulus
- Sensitization: an increase in behavioral response after exposure to a stimulus
 - Heightened responsiveness to other stimuli
- Learning occurs when an animal benefits from experience so that its behavior is better adapted to the environment
- Watson believed observable behavior was the only valid indicator of psychological activity
 - The environment and its associated effects were the sole determinates of learning
 - Influenced by John Locke → born knowing nothing and an infant acquires all its knowledge through sensory experiences
- Dishabituation: noticing when something you grew accustomed to stopped

6.2 How Do We Learn Predictive Associations?

- Classical conditioning (Pavlov conditioning): a type of associative learning in which a neutral stimulus comes to elicit a response when it is associated with a stimulus that already produces a response
 - You learn that one event predicts another
 - Conditioning trials then followed by test trials to test the responses
- Unconditional response (UR): a response that does not have to be learned, such as a reflex
 - Unlearned, automatic behavior
- Unconditioned Stimulus (US): A stimulus that elicits a response, such as a reflex, without any prior learning
- Conditioned stimulus (CS): a stimulus that elicits a response only after learning has taken place
 - A "signal"
- Conditioned response (CR): a response to a conditioned stimulus; a response that has been learned

- Acquisition: the gradual formation of an association between the conditioned and unconditioned stimulus
 - A process of association
 - The critical element is that a learned association and the stimulus occur at the same time, contiguity
- Extinction: A process in which the conditioned response is weakened when the conditioned stimulus is repeated without the unconditioned stimulus
 - The conditioned response is extinguished when the conditioned stimulus no longer predicts the unconditioned stimulus
- Spontaneous recovery: a process in which a previously extinguished condition response reemerges after the presentation of the conditioned stimulus
- Stimulus generalization: Learning that occurs when stimuli that are similar but not identical to the conditioned stimulus produce the conditioned response
- Stimulus discrimination: a differentiation between two similar stimuli when only one of them is consistently associated with the unconditioned stimulus.
- Rescorla-Wagner model: a cognitive model of classical conditioning; it holds that the strength of the CS-US association is determined by the extent to which the unconditioned stimulus is unexpected.
- Phobia: an acquired fear that is out of proportion to the real threat of an object or of a situation.
 - Develop through the generalize of fear experiences
- Conditioning: the process that connects environmental stimuli to behavior
- Strongest conditioning is when there is a very brief delay between the conditioned stimulus and the unconditioned stimulus
- Second-order conditioning: the CRs can be learned even without the learner ever associating the CS with the original US
- Some conditioned stimuli are more likely to produce learning
- Conditioned taste aversion: associating a certain taste with nausea, stomach upset, and vomiting
 - So strong it can be created after only one trial
- Different types of stimuli cause different reactions even within a species
- Biological preparedness: helps explain why animals tend to fear potentially dangerous things rather than objects that pose little threat
- Classical conditioning is a way that animals come to predict the occurrence of events
- The difference between expected and actual outcomes as prediction error
- Positive prediction error: strengthens the association between the CS and the US
- Negative prediction error: weakens the CS-US relationship
- Blocking effect: once a conditioned stimulus is learned, it can prevent the acquisition of a new conditioned response

- o When a second stimulus is added to a conditioned trial with a previously learned CS
- o Similar to second order conditioning
- Fear conditioning: classically conditioning animals to fear neural objects
- Counterconditioning

6.3 How Does Operant Conditioning Change Behavior?

- Operant conditioning (instrumental conditioning): a learning process in which the consequences of an action determine the likelihood that it will be performed in the future.
- Law of effect: Thorndike's general theory of learning: any behavior that leads to "a satisfying state of affairs" is likely to occur again, and any behavior that leads to "an annoying state of affairs" is less likely to occur again.
- Reinforcer: a stimulus that follows a response and increases the likelihood that the response will be repeated.
- Shaping: a process of operant conditioning; it involves reinforcing behaviors that are increasingly similar to the desired behavior.
 - o Reinforcing successive approximations eventually produces the desired behavior
- Positive reinforcement: the administration of a stimulus to increase the probability of a behavior's being repeated
 - o reward
- Negative reinforcement: the removal of an unpleasant stimulus to increase the probability of the behavior's being repeated.
- Continuous reinforcement: a type of learning in which behavior is reinforced each time it occurs.
 - o Can easily detect when the reinforcement has stopped
- Partial reinforcement: a type of learning in which behavior is reinforced intermittently.
 - o Effect depends on the reinforcement schedule
 - o Ratio schedule: based on the number of times the behavior
 - Fixed ratio schedule: when reinforcement occurs after a certain number of responses have been made
 - Variable ratio: reinforcement is provided after an unpredictable number of responses
 - o Interval schedule: based on a specific unit of time
 - Fixed interval schedule: when reinforcement is provided after a certain amount of time has passed
 - Variable interval schedule: reinforced after the passage of time but the time is not regular
- Partial-reinforcement extinction effect: the greater persistence of behavior under partial reinforcement than under continuous reinforcement.