

## Learning

Learning is any relatively permanent change in behavior brought about by experience or practice. Relatively permanent means that part of the brain is physically changed to record what was learned. This means that memory plays a big role in learning.

Learning is different from maturation which is genetically controlled. Walking for instance is caused by maturation and not learning. Children learn to walk when they do because their nervous system, muscle strength, and sense of balance have reached the point where walking is possible for them – all factors controlled by maturation, not by how much practice those children have had in trying to walk. No amount of practice will help a child walk before maturation makes it possible.

### I. Classical Conditioning

Ivan Pavlov (1849-1936), a Russian physiologist, experimented on the salivation of the dogs when he observed that some dogs start salivating when they hear the lab assistant bring their food, others when they hear the clatter of the food bowl from the kitchen, and still others when it was the time of day they were usually fed.

Elements of Classical Conditioning:

- Unconditioned stimulus (UCS): a stimulus capable of triggering a response and automatically evokes involuntary unconditioned response (UCR)
- Unconditioned response (UCR): an innate response naturally evoked by UCS
- Conditioned stimulus (CS): a stimulus paired with an unconditioned stimulus which evokes a conditioned response (CR)
- Conditioned response (CR): a learned response evoked by CS after CS-UCS pairing

Before conditioning, a neutral stimulus does not produce a response. (Neutral stimulus (NS) = Bell → No Salivation)

During conditioning, the UCS is introduced after the NS. (NS = Bell → UCS = food → UCR = salivation)

After conditioning, the former NS now produces the response of the UCS. (CS = Bell → CR=Salivation)

Pavlov believed that the NS became a substitute for the UCS through association in time.

The cognitive perspective asserts that the CS has to provide some kind of information or expectancy about the coming of the UCS in order for conditioning to occur.

Other concepts that are important in classical conditioning are:

- Stimulus generalization: tendency to respond to a stimulus that is only similar to the original conditioned stimulus with the conditioned response.

As an example: One Saturday morning, Liza's cat Pickles was chased by a dog. Pickles was not hurt, but was very frightened. Now if the cat was outside the house and a dog passes by, the cat will immediately run to the front door to be let in. As a result, the cat has shown fear to any type of dog not just to the dog which chased it.

- Stimulus discrimination: tendency to stop making a generalized response to a stimulus that is similar to the original conditioned stimulus because the similar stimulus is never paired with the unconditioned stimulus.

For instance, when a “fake” bell sound was used, similar to the true bell sound, the dogs initially responded, generalizing the stimulus. But when Pavlov did not give food at the sound of the “fake” bell sound, the dog eventually did not respond anymore, discriminating the original stimulus from the fake one.

- Extinction: disappearance or weakening of a learned response following the removal or absence of the unconditioned stimulus (in classical conditioning) or the removal of a reinforce (in operant conditioning).

For example, when Pavlov stopped giving food at the sound of the bell, the dogs gradually stopped salivating to the sound of the bell.

Another example: Liza stops by a coffee shop on her way to work. The cute guy who works at the counter always smiles at her which in turn makes Liza smile. When Liza made coffee at home, the smell of the coffee made her smile. The cute guy quit his work at the coffee shop, and the new crew who replaced him does not smile at Liza. Now, Liza no longer smiles when she smells coffee.

- Spontaneous recovery: reappearance of a learned response after extinction has occurred.

For instance, if the bell is paired again with the food, the dogs may salivate again at the sound of the bell. This time, faster than when it was first introduced.

- Higher-order conditioning: occurs when a strong conditioned stimulus is paired with a neutral stimulus, causing the neutral stimulus to become a second conditioned stimulus  
For example, if Pavlov snapped his fingers just before he rang the bell for several times, the finger snap will eventually produce a salivation response also.

## II. Phobia

John B. Watson and Rosalie Rayner were able to demonstrate that an emotional disorder called a phobia could be learned through classical conditioning by exposing a baby to a white rat and a loud noise, producing conditioned fear of the rat in a baby.

Another conditioned emotional behavior that we may commonly experience is taste aversion. Conditioned taste aversion occurs when an organism becomes nauseated or sick sometime after eating a certain food, which then becomes aversive to the organism. This can last for a period of days to several years.

Conditioned taste aversion is an example of classical conditioning. Food being a neutral stimulus is paired with an unconditioned stimulus, the illness, which then leads to unconditioned response of feeling sick. Subsequently, the previously neutral stimulus (food) now becomes a conditioned stimulus that produces a conditioned response (avoidance of food).

## III. Operant Conditioning

Classical conditioning is the kind of learning that occurs with reflexive, involuntary behavior. On the other hand, the kind of learning that applies to voluntary behavior is called operant conditioning.

Edward Thorndike developed the Law of Effect principle which states that if a response is followed by a pleasurable consequence, it will tend to be repeated, and if followed by an unpleasant consequence, it will tend not to be repeated. Thorndike used a puzzle box wherein the cat is placed inside the box and can get out by pushing on the little platform to one side of the door – at first accidentally. Each time the cat managed to escape, it would be put back into the box until, through trial and error, it knew to push on the platform to open the door. The time required by the cat to escape from the puzzle box gradually decreased with trials, but with obvious reversals.

Thorndike's work began the study of voluntary learning but B.F. Skinner was the one who had the greatest influence on it and who named it operant conditioning. Skinner developed the concept of reinforcement, the process of strengthening a response by following it with a pleasurable, rewarding consequence. Reinforcement can be positive or negative. In positive reinforcement, a response is followed by the presentation of a pleasurable stimulus, whereas in negative reinforcement, a response is followed by the removal or avoidance of an unpleasant stimulus.

Other concepts that are important in operant conditioning are:

- Shaping is the reinforcement of simple steps in behavior that lead to a desired, more complex behavior.

For example, if Jody wanted to train his dog to jump through a hoop, she would have to start with some behavior that the dog is already capable of doing on its own. Here, the goal is achieved by reinforcing each successive approximation (small steps in behavior, one after the other, that get closer and closer to the goal).

- Punishment is the presentation of an unpleasant event or outcome that makes the response less likely to happen again. In punishment by application, a response is followed by the application of an unpleasant stimulus such as spanking. In punishment by removal, a response is followed by the removal of some pleasurable stimulus, such as taking away a child's toy for misbehavior.

Punishment of both kinds normally has only a temporary effect on behavior. Punishment can be made more effective by making it immediate and consistent and by pairing punishment of the undesirable behavior with reinforcement of the desirable one.

#### IV. Cognitive Learning Theory

Classical conditioning and operant conditioning take into consideration the observable behavior. But in the 1960s, many psychologists became aware that cognition should not be ignored. Cognitive learning theory states that learning requires cognition or the influence of an organism's thought processes.

Edward Tolman, an American psychologist was one of the early cognitive learning behaviorists. He conducted several rat experiments to study learning which involved maze running. He studied how rats learn how to run complex mazes with the presence of reinforcement such as a reward. For rats who learned during the no reward trials, Tolman referred to that type of learning as latent learning (learning by exposure). Martin Seligman, on the other hand, found that dogs that had been placed in an inescapable situation failed to escape when it became possible to do so, remaining in that painful situation as if helpless to leave. Seligman called this phenomenon learned helplessness and found parallels between learned helplessness and depression. Clinical depression and mental illness may result from a perceived absence of control over a situation.

#### V. Observational Learning

Observational learning is learning through watching others perform or model certain actions. This is very evident yet crucial for babies.

Albert Bandura's famous Bobo doll experiment demonstrated that young children will imitate the aggressive actions of a model even when there is no reinforcement for doing so. He determined that four (4) elements are needed to be present for observational learning to occur: attention, memory, imitation, and motivation.

#### References:

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- Feldman, Robert. (2011). *Essentials of understanding psychology* (9<sup>th</sup> ed.). New York: McGraw-Hill Companies, Inc.