THEORIES OF LEARNING

2. BEHAVIORIST THEORIES

2.1. Behaviorism Overview

Behaviorism is an approach to psychology that combines elements of philosophy, methodology, and theory. It emerged in the early twentieth century as a reaction to mentalistic psychology, which often had difficulty making predictions that could be tested using rigorous experimental methods. The primary tenet of behaviorism, as expressed in the writings of John B. Watson, B. F. Skinner, and others, is that psychology should concern itself with the observable behavior of people and animals, not with unobservable events that take place in their minds. The behaviorist school of thought maintains that behaviors as such can be described scientifically without recourse either to internal physiological events or to hypothetical constructs such as thoughts and beliefs. From early psychology in the 19th century, the behaviorist school of thought ran concurrently and shared commonalities with the psychoanalytic and Gestalt movements in psychology into the 20th century; but also differed from the mental philosophy of the Gestalt psychologists in critical ways. Its main influences were Ivan Pavlov, who investigated classical conditioning although he did not necessarily agree with behaviorism or behaviorists, Edward Lee Thorndike, John B. Watson who rejected introspective methods and sought to restrict psychology to experimental methods, and B.F. Skinner who conducted research on operant conditioning.

In the second half of the 20th century, behaviorism was largely eclipsed as a result of the cognitive revolution. While behaviorism and cognitive schools of psychological thought may not agree theoretically, they have complemented each other in practical therapeutic applications, such as in cognitive–behavioral therapy that has demonstrable utility in treating certain pathologies, such as simple phobias, PTSD, and addiction. In addition, behaviorism sought to create a comprehensive model of the stream of behavior from the birth of a human to their death. Behaviorism focuses on one particular view of learning: a change in external behavior achieved through a large amount of repetition of desired actions, the reward of good habits and the discouragement of bad habits. In the classroom this view of learning led to a great deal of repetitive actions, praise for correct outcomes and immediate correction of mistakes. In the field of language learning

this type of teaching was called the audio-lingual method, characterized by the whole class using choral chanting of key phrases, dialogues and immediate correction.
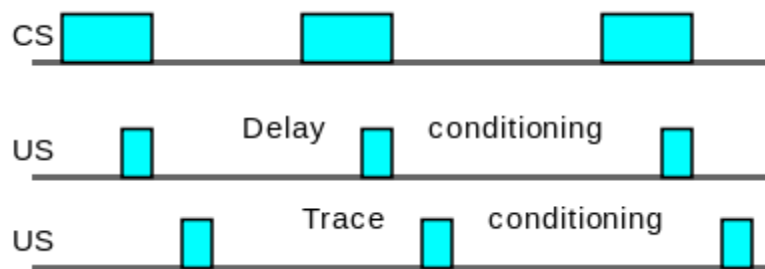
2.2. Classical Conditioning

Classical conditioning (also Pavlovian conditioning or respondent conditioning) is a kind of learning that occurs when a conditioned stimulus (CS) is paired with an unconditioned stimulus (US). Usually, the CS is a neutral stimulus (e.g., the sound of a tuning fork), the US is biologically potent (e.g., the taste of food) and the unconditioned response (UR) to the US is an unlearned reflex response (e.g., salivation). After pairing is repeated (some learning may occur already after only one pairing), the organism exhibits a conditioned response (CR) to the CS when the CS is presented alone. The CR is usually similar to the UR, but unlike the UR, it must be acquired through experience and is relatively impermanent. Classical conditioning differs from operant or instrumental conditioning, in which a behavior is strengthened or weakened, depending on its consequences (i.e., reward or punishment).

A classic experiment by Pavlov exemplifies the standard procedure used in classical conditioning. First Pavlov observed the UR (salivation) produced when meat powder (US) was placed in the dog's mouth. He then rang a bell (CS) before giving the meat powder. After some repetitions of this pairing of bell and meat the dog salivated to the bell alone, demonstrating what Pavlov called a conditional response, now commonly termed conditioned response or CR. Ivan Pavlov provided the most famous example of classical conditioning. During his research on the physiology of digestion in dogs, Pavlov developed a procedure that enabled him to study the digestive processes of animals over long periods of time. He redirected the animal's digestive fluids outside the body, where they could be measured. Pavlov noticed that the dogs in the experiment began to salivate in the presence of the technician who normally fed them, rather than simply salivating in the presence of food. Pavlov called the dogs' anticipated salivation, psychic secretion. From his observations he predicted that a stimulus could become associated with food and cause salivation on its own, if a particular stimulus in the dog's surroundings was present when the dog was given food. In his initial experiments, Pavlov rang a bell and then gave the dog food; after a few repetitions, the dogs started to salivate in response to the bell. Pavlov called the bell the conditioned (or conditional) stimulus (CS) because its effects depend on its association with food. He called the food the unconditioned stimulus (US) because

its effects did not depend on previous experience. Likewise, the response to the CS was the conditioned response (CR) and that to the US was the unconditioned response (UR). The timing between the presentation of the CS and US affects both the learning and the performance of the conditioned response. Pavlov found that the shorter the interval between the ringing of the bell and the appearance of the food, the stronger and quicker the dog learned the conditioned response.

Example of Conditioned Stimulus (CS) and Unconditioned Stimulus (US)

Learning is fastest in forward conditioning. During forward conditioning, the onset of the CS precedes the onset of the US in order to signal that the US will follow. Two common forms of forward conditioning are delay and trace conditioning.
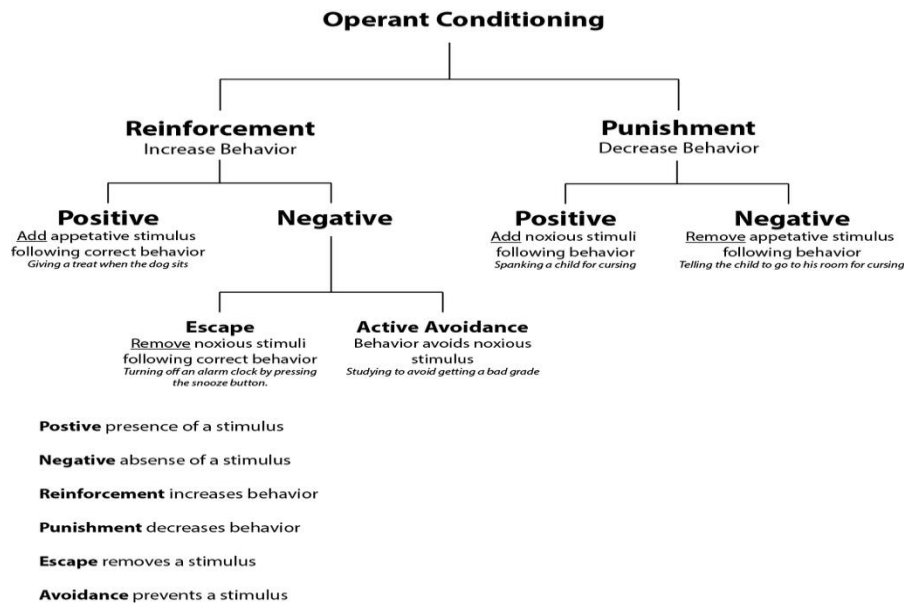
- **Delay conditioning**: In delay conditioning the CS is presented and is overlapped by the presentation of the US.
- **Trace conditioning**: During trace conditioning the CS and US do not overlap. Instead, the CS begins and ends before the US is presented. The stimulus-free period is called the trace interval. It may also be called the conditioning interval.

2.3. Operant Conditioning

Operant conditioning (or instrumental conditioning) is a type of learning in which an individual's behavior is modified by its antecedents and consequences. Mechanisms of instrumental conditioning suggest that the behavior may change in form, frequency, or strength. The expressions operant behavior and respondent behavior were popularized by B. F. Skinner. The former refers to an item of behavior that is initially spontaneous, rather than a response to a prior stimulus, but whose consequences may reinforce or inhibit recurrence of that behavior. Operant conditioning is distinguished from classical conditioning (or respondent

conditioning) in that operant conditioning deals with the reinforcement and punishment to change behavior. Operant behavior operates on the environment and is maintained by conditioning of reflexive (reflex) behaviors which are also elicited by antecedent conditions, while classical conditioning is maintained by its antecedents and consequences. Behaviors conditioned through a classical conditioning procedure are not maintained by consequences. They both, however, form the core of behavior analysis and have grown into professional practices.

Table of Operant Conditioning Process

Operant Conditioning

Reinforcement
Increase Behavior

Punishment
Decrease Behavior

Positive
<u>Add</u> appetative stimulus
following correct behavior
Giving a treat when the dog sits

Negative

Positive
<u>Add</u> noxious stimuli
following behavior
Spanking a child for cursing

Negative
<u>Remove</u> appetative stimulus
following behavior
Telling the child to go to his room for cursing

Escape
<u>Remove</u> noxious stimuli
following correct behavior
Turning off an alarm clock by pressing the snooze button.

Active Avoidance
Behavior avoids noxious stimulus
Studying to avoid getting a bad grade

Postive presence of a stimulus

Negative absense of a stimulus

Reinforcement increases behavior

Punishment decreases behavior

Escape removes a stimulus

Avoidance prevents a stimulus

B.F. Skinner is the person whose work is most often cited in connection with operant conditioning. To implement his empirical approach, Skinner invented the operant conditioning chamber in which subjects such as pigeons and rats were isolated from extraneous stimuli and free to make one or two simple, repeatable responses. Another invention, the cumulative recorder, produced a graphical record of these responses from which response rates could be estimated. These records were the primary data that Skinner and his colleagues used to explore the effects on response rate of various reinforcement schedules. A reinforcement schedule may be defined as any procedure that delivers a reinforcer to an organism according to some well-defined rule. The effects of schedules became, in turn, the basic experimental data from which Skinner developed his account of operant

conditioning. He also drew on many less formal observations of human and animal behavior.

2.4. Social Learning Theory

Social learning theory states that learning is a cognitive process that takes place in a social context and can occur purely through observation or direct instruction, even in the absence of motor reproduction or direct reinforcement. In addition to the observation of behavior, learning also occurs through the observation of rewards and punishments, a process known as vicarious reinforcement. The theory expands on traditional behavioral theories, in which behavior is governed solely by reinforcements, by placing emphasis on the important roles of various internal processes in the learning individual. Within this context, Albert Bandura studied learning processes that occurred in interpersonal contexts and were not adequately explained by theories of operant conditioning or existing models of social learning, such as the work of Julian Rotter. Specifically, Bandura argued that the weaknesses of learning approaches that discount the influence of social variables are nowhere more clearly revealed than in their treatment of the acquisition of novel responses. Skinner's explanation of the acquisition of new responses relied on the process of successive approximation, which required multiple trials, reinforcement for components of behavior, and gradual change. Rotter's theory proposed that the likelihood of a behavior occurring was a function of the subjective expectancy and value of the reinforcement. This model assumed a hierarchy of existing responses and thus did not (according to Bandura) account for a response that had not yet been learned. Bandura began to conduct studies of the rapid acquisition of novel behaviors via social observation, the most famous of which were the Bobo doll experiments.

Social learning theory integrated behavioral and cognitive theories of learning in order to provide a comprehensive model that could account for the wide range of learning experiences that occur in the real world. As initially outlined by Bandura, key tenets of social learning theory are as follows:

1. Learning is not purely behavioral; rather, it is a cognitive process that takes place in a social context.
2. Learning can occur by observing a behavior and by observing the consequences of the behavior (vicarious reinforcement).
3. Learning involves observation, extraction of information from those observations, and making decisions about the performance of the behavior

(observational learning or modeling). Thus, learning can occur without an observable change in behavior.

4. Reinforcement plays a role in learning but is not entirely responsible for learning.
5. The learner is not a passive recipient of information. Cognition, environment, and behavior all mutually influence each other (reciprocal determinism).

Social learning theory draws heavily on the concept of modeling, or learning by observing a behavior. Bandura outlined three types of modeling stimuli:

- **Live model** in which an actual person is demonstrating the desired behavior

- **Verbal instruction** in which an individual describes the desired behavior in detail and instructs the participant in how to engage in the behavior

- **Symbolic** in which modeling occurs by means of the media, including movies, television, Internet, literature, and radio. Stimuli can be either real or fictional characters.

Exactly what information is gleaned from observation is influenced by the type of model, as well as a series of cognitive and behavioral processes, including:

- **Attention** - In order to learn, observers must attend to the modeled behavior. Attention is impacted by characteristics of the observer (e.g., perceptual abilities, cognitive abilities, arousal, past performance) and characteristics of the behavior or event (e.g., relevance, novelty, affective valence, and functional value).

- **Retention** - In order to reproduce an observed behavior, observers must be able to remember features of the behavior. Again, this process is influenced by observer characteristics (cognitive capabilities, cognitive rehearsal) and event characteristics (complexity).

- **Reproduction** - To reproduce a behavior, the observer must organize responses in accordance with the model. Observer characteristics affecting reproduction include physical and cognitive capabilities and previous performance.

- **Motivation -** The decision to reproduce (or refrain from reproducing) an observed behavior is dependent on the motivations and expectations of the observer, including anticipated consequences and internal standards.

An important factor in social learning theory is the concept of reciprocal determinism. This notion states that just as an individual's behavior is influenced by the environment, the environment is also influenced by the individual's behavior. In other words, a person's behavior, environment, and personal qualities all reciprocally influence each other. For example, a child who plays violent video games will likely influence their peers to play as well, which then encourages the child to play more often. This could lead to the child becoming desensitized to violence, which in turn will likely affect the child's real life behaviors.