

THEORIES OF LEARNING

6.1 ASSOCIATIVE THEORIES OF LEARNING

Psychologists have developed two principle types of learning theories to explain how individual learn: behavioural or associative and cognitive.

Behaviour learning theories tend to emphasize observable behaviour, such as classroom behaviour or new skills or knowledge that can be demonstrated. Behavioural learning theorist is particularly interested in the way pleasurable or painful consequences of behaviour change the individual's behaviour over time.

A major goal of the behaviourist is to determine the laws governing learning. The concern about the nature of learning has dominated academic psychology for most of this century. A number of ideas contributed to the behavioral view. The Greek philosopher Aristotle's concept of the association of ideas is one important origin of behaviourism.

6.1.1 Conditioning

Conditioning is considered by many psychologists to be the fundamental form of learning underlying the development of some of the earliest response patterns in newborn infants. Conditioning has been demonstrated to occur even before birth. Through conditioning the organism's responses to a great variety of stimulus situations are changed.

A. Classical Conditioning

Classical conditioning may be defined as the formation (or strengthening) of an association between a conditional stimulus and a response through the repeated presentation of the conditional stimulus in a controlled relationship with an unconditioned stimulus that originally elicits that response.

The best known experiment in classical conditioning was performed by a Russian physiologist and Nobel prize winner, Ivan Pavlov, who accidentally discovered the conditioned response while performing a series of routine physiological experiments (Pavlov, 1927) Pavlov was studying digestion and salivation in dogs, using an apparatus which collected and measured the secretions of live animals by means of tubes implanted in the stomach or cheek. In these experiments, meat powder was placed in a dog's mouth and his salivary response to the food was observed. Pavlov's assistants reported that after a number of trials with any particular dog, the animal would begin to salivate when he saw the food, before it was actually placed in his mouth. Soon he would salivate at the

sight of the food dish, and finally even at the sound of the assistant's approaching footsteps. Pavlov, realizing that his phenomenon was of great significance, changed the course of his investigations.

Pavlov's studies have had a widespread influence on the development of psychological thought. The process of conditioning has since been demonstrated experimentally in countless experiments with both animal and human subjects, and the conditioned response has become a fundamental concept in modern psychology.

B. Extinction and Recovery

Two other important phenomena discovered in Pavlov's investigations were experimental extinction and spontaneous recovery. As long as the dog was given food after the sound of the bell, his salivary response to the bell continued. But repeated soundings of the bell without reinforcement (the presentation of food) resulted in the gradual disappearance of the conditioned response, a phenomenon known as experimental extinction. When the dog was allowed to rest for a day after intense extinction training, however, salivation again occurred at the sounding of the bell. The conditioned response was recovered "spontaneously". But on this second day, with continued lack of reinforcement, the point of zero salivation was reached in fewer trials; and within a few more days. The unrewarded trials resulted in permanent extinction of the conditioned response. Without such extinction training, a dog might retain the conditioned response for three or four months with little decrease in its strength.

i. Conditioning Paradigms

Five different paradigms have been used in conditioning studies. These procedures, representing the varied ways in which a CS can be paired with the UCS, are not equally effective. The delayed conditioning paradigm usually is the most effective; the backward conditioning, the least effective.

ii. Delayed Conditioning

In delayed conditioning, CS on-set precedes UCS on-set. The termination of the CS occurs either with UCS onset or during UCS presentation. If, for instance, a darkening sky precedes a severe storm, this situation is an example of delayed conditioning. The darkening sky is the CS; its occurrence precedes the storm and it remains present until the storm occurs. Having experienced this type of conditioning, a person will be quite frightened whenever he or she sees a darkened sky.

iii. Trace Conditioning

With this conditioning paradigm, the CS is presented and terminated prior to UCS onset. A parent, who calls a child to dinner is using a trace conditioning procedure. In this example the announcement of dinner (CS) terminates prior to the presentation of food (UCS). As we will discover in the next section, hunger developed with this paradigm can be quite weak unless the interval between CS termination and onset is very short.

iv. Simultaneous Conditioning

The CS and UCS are presented together when the simultaneous conditioning paradigm is used. The example may be when you enter and walk into the fast food restaurant, in this setting, the restaurant (CS) and the food (CS) occur at the same time. And probably it would lead to weak hunger conditioned to the restaurant.

v. Backward Conditioning

In Backward Conditioning paradigm, the UCS is presented and terminated prior to the CS.

vi. Temporal Conditioning

There is no distinctive CS in temporal conditioning. Instead the UCS is presented in regular intervals, and over time the CR will be exhibited just prior to the onset of the UCS. To show the conditioning has occurred, the UCS is omitted and the strength of CR Assessed. What mechanism allow for temporal conditioning? In temporal conditioning, a biological state provides the CS. When the same internal state precedes each UCS exposure, that state will be conditioned to elicit the CR.

C. Connectionism Theory by E.L. Thorndike

Thorndike viewed learning as a series of stimulus-response (S-R) connection, or bonds. His theories of learning describe the ways in which these (S-R) connections could be strengthened or weakened. He felt that learning was basically a trial-and-error enterprise, and he paid little attention to the possibility of concept formation or thinking.

Thorndike's Puzzle-Box Studies: Around 1900, Edward L. Thorndike conducted a series of studies on animal intelligence, a number of them involving cats in puzzle boxes. The general features of the research situation were as follows.

A hungry cat was placed in a cage with food placed outside the cage, which was so constructed that the door to the cage could be opened by pulling a string somewhere in the cage. Typically, the cat would make a direct and futile attempt to get the food by

typing to squeeze through the bars, clawing at the string, and generally engaging in a fair amount of clawing and striking all over the cage. Given enough of such activity, the cat would eventually claw the string, thus opening the door and enabling the cat to get the food. When placed in the cage again after a time, the cat would behave quite similarly to its behaviour on the first occasion, clawing and striking about and eventually getting the door open. Over repeated trials in the puzzle box, the cat would gradually restrict its activity to the area containing the string and, only after a considerable number of trials, would eventually go directly to the string when placed in the cage observations and open the door. These observations led Thorndike to propose that problem solving is a matter of trial and error, with successful response gradually “stamped-in” and unsuccessful responses “stamped-out”. There seemed to be no reason to attribute to the animal any insight, reasoning, or understanding of the situation, rather it appeared that the psychologist’s task was to identify the principles underlying the strengthening and weakening of various responses to a stimulus situation.

Three Major Laws

Thorndike postulated three major laws of learning:

(i) The Law of Readiness

When an organism is in a state in which the conduction units (S-R connections) are ready to conduct, then the conduction is satisfying. If the conduction unit is not ready to conduct, then conduction is annoying. Thorndike was referring to a more momentary phenomenon, a kind of neurologically teachable moment.

(ii) The Law of Effect

This was by far Thorndike’s most important law. It states that an S-R connection followed by satisfaction (reward) is strengthened. Also a connection followed by annoyance (punishment) is weakened. He came to feel that reward strengthened learning far more than punishment weakened it. His evidence for changing his position on this issue was, to say the least, rather flimsy. It was based on a study of symbolic reward and punishment, where the reward consisted of saying “Right” and the punishment consisted of saying “wrong” to the students. The results might have been quite different if the reward had been a candy bar and the punishment a mild electric shock.

D. Edwin Guthrie: Behaviourist Associationist

The last of the early associationists was Edwin Guthrie. Guthrie was the behaviourist-associationist par excellence. Following directly in Waston's footsteps, he rejected any psychological concept that might have "mentalistic" overtones. He postulated one law of learning: learning by association or, as he called it, contiguity. According to Guthrie, if a certain stimulus (or pattern of stimuli) is followed by a response, then the next time that stimulus appears, the same response will follow. That's all there is to it stimuli and responses in sequence. There is no need to call on reward, reinforcement, or "effect" in order to explain how learning occurs. He also believed that learning occurs the first time the stimulus and response become associated.

To create conditions that will promote learning, Guthrie believed that the teacher should provide the stimulus and the student should respond. For example, the teacher might point to a map and the students would then reply with the name of the city. The important thing was for the appropriate stimulus to be presented before the desired response occurred.

A frenzied mother once brought her child to Guthrie. The child had been in the habit, on coming home from school, opening the door of his home, taking off his coat, and throwing it on the floor. The mother told Guthrie that no matter how many times she told her child to pick up coat and hang it in the closet, the child continued this behaviour. Guthrie did not reach for any deep psychological explanation, like finding out what throwing the coat on the floor symbolized, what it "meant" to the child. He simply told the mother to rearrange the stimulus response sequence. When the child throws his coat on the floor, he should not be told to hang it up. He should instead be told to put the coat on, go back outside, come through the door and, only then, hang up the coat. Thus hanging up the coat could become a response to the stimulus of entering the house, rather than to the stimulus of the mother's command. "Take your coat off the floor and hang it up".

6.2 COGNITIVE THEORIES OF LEARNING

Include one's ideas, beliefs, thoughts and images. When we know, understand or remember something, we use cognition to do so. Cognitive processes are mental activities that involve forming, manipulating and using cognition or cognition is a term used to describe all of our mental processes such as perceptions, memory and judgment.

Cognitive approaches to learning emphasize changes that occur within an organism's system of cognition. Its mental representation of itself and the world cognitive learning involves the acquisition of knowledge or understanding and need not be directly reflected in behaviour. As the most important mental process is thinking and cognitivists focus most of their attention on studying how people think. In cognitive theories, however thinking plays the central role.

A. Max Wertheimer: Gestalt Psychology

Max Wertheimer, founded the school of psychology called Gestalism, or Configuration. Wertheimer insisted that it was useless to study small parts of psychological concepts, like perception or learning. Studying parts in isolation was unjustified, because changing any singly part necessarily changes the whole. Similarly, the whole may remain, even when all the parts have changed. For example, if we play a tune in two different keys, even though the individual notes are different each time, the tune retains its integrity.

Wertheimer was concerned with the way children learn, particularly in school. He was against the use of rote memorization, especially when it so often seemed to be an end in itself. Above all else, he wanted children to achieve understanding, to have insight into the nature of the problem.

B. Wolfgang Kohler: Learning by Insight

Wolfgang Kohler, who had worked with Wertheimer at the University of Frankfurt, spent a few years during World War I on the island of Tenerife, off the coast of Africa. There he performed Gestalt psychology's most famous animal studies. Kohler arranged an ape's cage so that there were bananas hanging from the top a couple of boxes on the floor. In order to reach the bananas, the ape had to stack one box on top of another and then climb to the top. The ape's solution to the problem appeared to Kohler not to be one of blind trial and error. Instead, the ape seemed to size up the situation and almost in a flash, it understood the problem and "saw" the solution. The ape displayed what Kohler called insight, and Kohler felt that this was more typical of learning especially human learning, than Thorndike's concept of blind trial and error.

In another experiment, Kohler put food outside the cage, beyond even an ape's long reach. Inside the cage, however, there were some sticks. At first the apes would throw the sticks at banana. Then they "realized" that by using the stick as a kind of tool they could

reach out and rake the banana in one, especially intelligent ape, named Sultan, were even able to join two short sticks together to rake the food in.