
UNIT 3 LEARNING*

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3.0 LEARNING OBJECTIVES

After reading this unit, you will be able to,

- explain the nature and scope of learning;
- identify different types of learning;
- differentiate and describe the theories of learning; and
- summarize the strategies used in the process of learning.

3.1 INTRODUCTION

You have acquired many good things in your life-time, such as, you know how to read, write and perform other functions in socially desirable manner. You have acquired these through experience in your life time. Such an experience has remained interactive. These skills help you in adjusting in life in an appropriate manner. How have you acquired such behaviour patterns? This is through the process of learning. Learning process is crucial to all organisms which eventually results in proper adaptation in different situations. In this unit, you will be introduced to learning, one of the key aspect of life. You will also know the learning processes and their characteristics. The theories and other related facts will also be presented in a simple manner.

* Dr. Arti Singh, Academic Associate of Psychology, IGNOU, New Delhi and Dr. Meetu Khosla, Associate Professor of Psychology, Daulat Ram College, University of Delhi.

3.2 NATURE OF LEARNING

Learning is the key factor involved in behavioural change of an organism. Through learning, we make changes in our behaviour. There are many processes from which we get experience in life. Psychologists have found out such processes and are constantly engaged in conducting research in such areas.

The term learning has been defined by psychologists in many ways. According to the most acceptable definition, it is a “relatively permanent change in behaviour (or behaviour potential) resulting from experience” (Baron, 2001). Three aspects in this definition that need attention are, first, ‘relatively permanent change’. It is important to mention here that any temporary change in behaviour can not be termed as learning. Such as, feeling sleepy after taking drugs or heavy meals or feeling tired due to illness. Second, permanent change due to ageing or maturation (as a person grows and develops), will not be considered as learning. For example, change in height takes place because of maturation. Third, here ‘experience’ does not mean our own experience only. Learning can also occur through direct experiences as well as vicarious, i.e., observing events and participating in them (Bandura, 1986).

From the above explanation, it is obvious that all modifications of behaviours are not learned. Some modifications do take place due to physical maturity. In most of the cases the distinction between learning and maturation is very clear but in some places this distinction is less obvious. You take an example of infant’s walking. Normally, infant does not walk before the age about 12-15 months. They walk when they are physically fit and ready, perhaps, without learning. So, walking here does not have the role of learning. But in children, recognition of colour is the outcome of learning. This way, the impact of learning and maturation on modification of behaviour are different.

Now, the question is why we ‘learn’? What is the importance of the process called ‘learning’. Learning is an important process in human behavior. The reason being, it helps us in adaptation and in survival. Learning may be good as well as bad, and learning can be of many types. Some of the most important types of learning have been discussed in the following section.

3.3 TYPES OF LEARNING

a) **Motor learning**

Motor learning involves acquiring of a new motor skill or functions as a result of practice or experience. This learning helps us in executing motor functions, for example walking, running, skating, driving, climbing, etc.

b) **Verbal learning**

It involves acquiring skills to communicate with others by using words, sounds, pictures, etc. The earlier studies were conducted with *nonsense syllables* which differed according to meaningfulness. A list of syllables of high association value, such as LUV, LOS, RUF, were compared to syllables which are comparatively meaningless, like XUY, ZER, XUT. McGeoch (1930) concluded that when the learning of three-letter words was compared to the learning of nonsense syllables with different association values, three-letter words were significantly easier to learn than nonsense syllables with 100 percent association value; when the association value decreased, the non-sense syllables were harder to learn.

c) **Concept learning**

The type of learning in which we learn to classify stimuli based on its characteristics

and features. For example, our ability to identify a barking, four legged animal with a tail as a 'dog', is the part of concept learning. We have learned that the word dog refers to this particular type of described animal. A classic study by Bruner, Goodnow, and Austin (1956) emphasized cognitive interpretations of the process of concept formation. Eighty-one cards were used in the experiment that were different on the basis of four attributes, namely number of borders, color of figures, shape of figures, and number of figures. The task was to learn the concept that the experimenter has in mind. For instance, 'all cards with one figure and two borders'. The cards are presented and the participant says that the card is an example of the concept or not. The experimenter tells whether the response is right or wrong for each card. Thus, the process helps in forming a hypothesis that makes the participant learn the concept.

d) **Discrimination learning**

Our ability to discriminate between stimuli and giving response accordingly is known as discrimination learning. In one of the classic study of concept formation conducted by Hull (1920), analysed the findings on the bases of discrimination learning. The participants learned to discriminate the *common element* in the characters and on the basis of one's experiences, can recognize and use similar elements when they appear in new settings. Hull interpreted concept formation, on the principles of conditioned learning- reinforcement, generalization, and selective discrimination.

3.4 THEORIES OF LEARNING

Learning is a very integral part of our lives. It influences the way we perceive information, understand and use language, our thoughts, beliefs, attitudes, and so forth. Learning is a change in behavior that is relatively permanent in nature as it is influenced by practice and experience. The change in behavior could be good or bad and it may last for some time at least. There are different ways in which learning occurs and this will be explained as follows:

3.4.1 **Pavlov's Classical Conditioning**

Ivan Petrovich Pavlov (1849-1936), a famous Russian physiologist, was the pioneer in the study of learning. He was awarded Nobel Prize in 1904 in the field of medicine, for his work on physiology of digestion. He used classical experiments in learning and established many basic principles of learning. Classical conditioning is a kind of learning that is based on the classical experiments by Pavlov. This kind of conditioning is also known as **respondent conditioning** or **Pavlovian conditioning**. This kind of conditioning involves pairing of two stimuli. One is called as the *conditioned stimulus (CS)* and the other is *unconditioned stimulus (UCS)*. The CS is also known as the neutral stimulus. This is so because when it is presented initially for a first few times, it merely serves to alert the organism and not evoke any response. The UCS is a stimulus that produces a reflex response consistently known as *unconditioned response (UCR)*. The CS and UCS are paired repeatedly a number of times so that conditioning can be done. The CS is presented a little before the UCS. The time gap between the CS and UCS is known as the *inter-stimulus interval* and it ranges from about half a second to a few seconds. When the neutral stimulus is repeatedly paired with the UCS, it acquires the properties of the UCS and hence produces the unconditioned response, UCR. If the CS and the UCS are paired a number of times with appropriate inter-stimulus interval, then the stimulus that was originally neutral will begin to produce a response that is produced by the UCS before the CS and UCS were paired together.

In his classic experiment, Pavlov designed a special apparatus to assess how much saliva the dog elicits on seeing the food. He attached a tube to his salivary glands that could collect the saliva that was secreted and collect it in a cup attached to the dog's neck. Pavlov trained the dog to salivate at the sound of the bell. He rang the bell after presenting the food that was the UCS. This was done a number of times till the dog acquired the conditioning, which is the relationship between the food and the bell. This was plotted on a learning curve and was known as the *acquisition curve*. When the CS was repeatedly paired with the UCS, the salivation increased. Pavlov repeatedly tested this with new CS and UCS and found that any stimulus that reliably produces a reflex response can serve as a UCS. Once the response has been acquired, if the bell (CS) is rung without presenting the food (UCS), then the dog's salivation decreased. That is to say, that if the CS is presented without being followed by the UCS, the CR reduces gradually, known as *extinction curve*. After a period of rest, when the bell (CS) was rung again, it led to salivation in the dog. This is known as *spontaneous recovery*, as the learning had not completely ended and after a break, the dog responded thinking about the past association between the CS and UCS. Hence, this association had not diminished. That is to say that some learning still remained after extinction (Pavlov's experiment). The level of saliva was much more at the time of spontaneous recovery than it was at the time of extinction. When the pairing of the CS and the UCS was repeated again, it produced a stronger response (salivation). This is known as *reconditioning*.

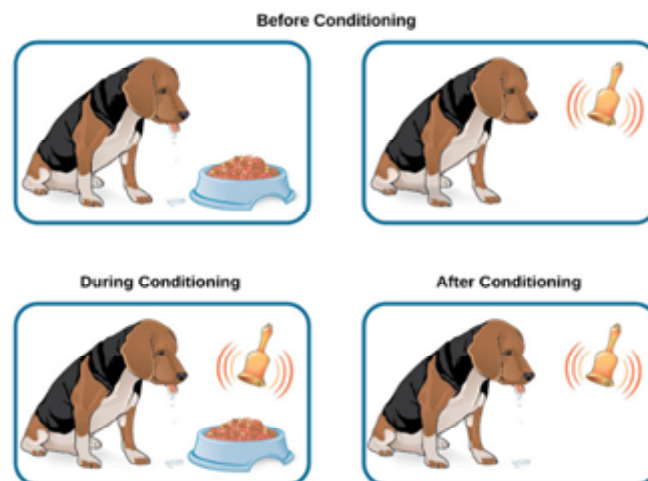


Figure 3.1: Steps involved classical conditioning of a dog

Image Source: <https://courses.lumenlearning.com>

Box 3.1

A review of important terms:

Unconditioned Stimulus (UCS): A stimulus that can produce response unconditionally and naturally, whenever it is presented. For example, cutting an onion can make you cry or pollen from flower can make you sneeze. Here, onion and pollen are two examples of UCS.

Conditioned Stimulus (CS): A stimulus that was initially neutral in nature i.e., was not capable of producing any response. Later, with repeated pairing with UCS, it is able to predict a UCS and thus can elicit the response originally meant for UCS only.

Unconditioned Response (UCR): Response for which we do not need any previous learning i.e., which occurs automatically without any condition. As discussed already, 'crying' while cutting onion and 'sneezing' due to pollen, are two examples of UCR.

Conditioned Response (CR): The response we give to a conditioned stimulus because of some experience is known as CR.

Principles of Classical Conditioning

Pavlov's experimental findings concluded five basic principles of classical conditioning. They are summarized as follows:

Acquisition: A CR is acquired by a series of contiguous pairings of CS and UCS. In *simultaneous conditioning*, CS and UCS are presented at the same time and continue together until CR occurs. In *trace conditioning*, CS is presented first, and after a brief delay UCS follows. In *backward conditioning*, UCS is presented before CS. In *delayed conditioned response*, CS is presented somewhere between few seconds up to a minute before UCS and may continue with it for a few seconds. According to Pavlov, simultaneous, trace and delayed conditioning were effective procedures to acquire learning.

Extinction: Once Conditioned, Always Conditioned?

Pavlov after coming up with the principle of learning tried to understand the conditions under which one can unlearn the acquired conditioning. So, how can we get rid of conditioning? Stop giving UCS. When the conditioned stimulus is presented for a number of times in the absence of UCS, it will eventually lead to the disappearance of the conditioned response; this phenomenon has been termed by Pavlov as **extinction**. In the context of Pavlov's dog, if the bell was not followed by any food for many presentations, then after some time, the dog will stop salivating in response to the bell. But, when US (bell) is again followed by UCS (food) after extinction has taken place, conditioned response (salivation) will return very quickly—a process known as **reconditioning**. The reappearance of the conditioned response after a time interval due to UCS-CS pairing is known as **spontaneous recovery**.

Generalization and Discrimination: Responding to similarities and differences

Pavlov also found that if the animal could be trained to respond to a bell, he could also be trained to respond to a buzzer with a similar response. This is known as **generalization** of the CS to other stimuli that were somewhere similar to the original CS where the learning took place. The level of generalization depends upon the extent to which the new stimulus is similar to the CS. Sometimes phobia can be treated by using this procedure by pairing the feared stimulus with a pleasant one. On the contrary, if Pavlov's dog responded to the bell used in the experiment only and ignored other similar sounding bell, then this phenomenon will be called as **stimulus discrimination**—tendency to make a response to a certain stimulus and ignore others.

Higher-Order Conditioning

A CS after acquiring the ability to elicit CR may acquire reinforcing properties. For example, buzzer (CS) has been used to elicit salivation (CR) with food (UCS). After salivation is established to the buzzer (CS or CS₁), CS₁ will now be paired with a flashing light (CS₂). After repeated trials CS₂ will elicit CR₂. This is when higher-order conditioned response is established. Such responses are difficult to establish and maintain.

Principles of classical conditioning can help in behavior modification or behavior therapy by extinction or reconditioning of the unpleasant emotional responses.

3.4.1.1 The Little Albert Experiment: Applying Classical Conditioning on Human Learning

Can we apply the principle of classical conditioning on human learning also? **John**

B. Watson was highly influenced by Pavlov's work on dogs. Thus, Watson wanted to demonstrate that the principles applied to humans also. Watson and his co-researcher **Rosalie Rayner**, conducted an experiment 'Little Albert' on a nine-month old child named "Albert". Watson hypothesized that children's fearful response to loud noise is an unconditioned response. He further proposed that using the principles of classical conditioning a child can be made fearful to any neutral stimulus. In the baseline condition of experiment, Watson and his assistants exposed little Albert to a number of stimuli (harmless objects and animals) such as a white rat, a rabbit, mask etc. As expected, the little Albert did not show any fearful response to these objects. In control condition, when Albert was exposed to the rat, Watson made a frightening noise by striking a piece of metal with a hammer. This made Albert fearful and he started crying. After repeated presentation of white rat with a loud noise, he began to cry just after seeing the rat and tried to escape. Later, it was observed that Albert started to generalize his fear and became afraid to similar looking white and furry objects, like a rabbit, fur coat, and a fake beard.

So, in the above experiment,

Neutral Stimulus: White rat

Unconditioned Stimulus: Loud noise

Unconditioned Response: Crying and fearful emotional response

Conditioned Stimulus: White rat

Conditioned Response: Crying and fearful emotional response



Figure 3.2: Rat or rabbit, I don't like it.

ImageSource: <https://www.newscientist.com>

Watson claimed that human behavior could entirely be determined by careful manipulation of stimulus and response.

Box 3.2: Learned Helplessness

The phenomenon of learned helplessness was given by Martin Seligman in the late 1960s while working on classical conditioning with dogs. He noticed that those dogs who received an unavoidable electric shock for a number of times did not act to rescue themselves when they had an opportunity for it in the subsequent situations. Whereas, those dogs who received no inescapable shock, took action to save themselves from the electric shock. He termed the behaviour of the first group as *learned helplessness*—one's learned response to not to take any appropriate action to avoid aversive stimuli. In other words, one's tendency to avoid taking any action for a successful escape from an aversive or painful situation due to the history of failed attempts. The theory of learned helplessness has also been successfully applied to understand the problem of depression in human beings.

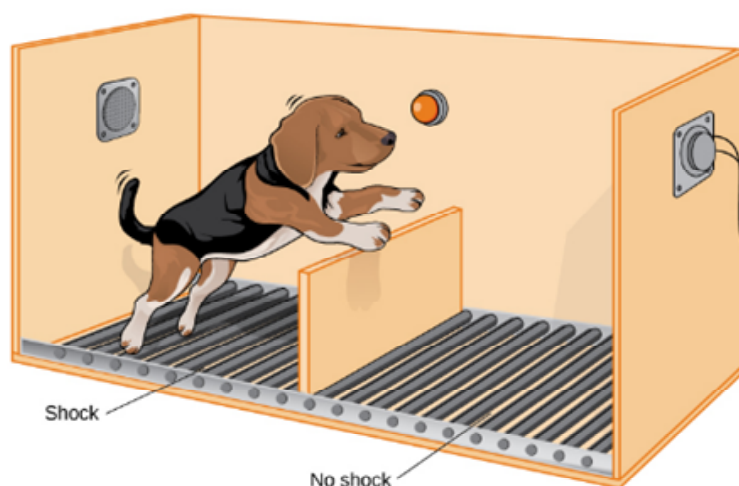


Figure 3.3: Seligman's learned helplessness experiments with dogs used an apparatus that measured when the animals would move from a floor delivering shocks to one without.

Image Source: <https://virtualuniversity.in>

3.4.2 Skinner's Instrumental Conditioning

Instrumental conditioning is also known as operant conditioning. This kind of learning involves some kind of behavior or action that is instrumental in producing reinforcement (or reward) when it operates upon the environment. Operant conditioning is based on the research findings of **Edward L. Thorndike** and **B.F. Skinner**. In this learning, the most important thing to understand is reinforcement. Reinforcement is any stimulus or event which increases the likelihood that the response will occur again. It could be a reward or a punishment. For example, when the rabbit is given a carrot after running a distance, he will run faster to eat more carrots. Here, carrot is reinforcement in the form of reward. Thus, we can say that the nature or occurrence of a particular response depends on the extent to which the reinforcement is given. Hence, the term operant is used. That is the way the response operates on the environment, its desirability or non-desirability will strengthen or weaken the occurrence of the response.

Skinner used a simple experiment to explain this concept. He placed a rat in a box. There was a lever which if pressed would activate the food or water delivery mechanism. This was called as the Skinner box. The rat is placed in a box and the experimenter delivers the food pellets by pressing the lever from outside. The rat eats the pellet one at a time. After some training, the rat is left alone in the box and the experimenter does not release the food pellets for him. After some time, when the rat is hungry again, he moves about exploring the box and by chance tends to press the lever that releases the food pellet. Thus, food pellet is the reinforcement that depends upon the pressing of the lever. Then the rat moves about in the box and again tends to press the lever by chance. This enables him to eat another food pellet. Thus, after that he does not explore much but tends to press the lever again and again quickly to eat the food pellets that are released. Hence, the operant behavior is very evident now. The number of times the rat presses the bar in a particular time are counted and recorded as rate of responding per unit. A cumulative recorder is used to record the rate of responding, that is the number of responses recorded per unit time. The examples of reinforcement could be smiles or approval of others that can make the response more likely to occur.

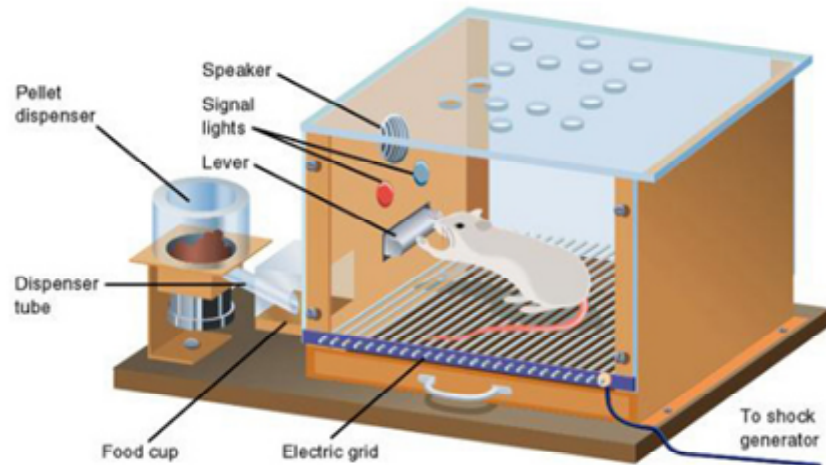


Figure 3.4: A Skinner box

Image Source: <https://www.simplypsychology.org/>

Operant conditioning helps in shaping a response. The reinforcement can be used to shape the behavior in a relatively shorter period of time. The learner learns the desired behavior when the chain of simple behaviors leading to the desired behavior is reinforced step by step. As each step is learned and the desired response is given, reinforcement is given. This makes the occurrence of the response more likely to occur again. This method of shaping is known as the method of *successive approximations*. This method of shaping is often used to shape the behavior of children, attitude, language, beliefs, etc. For example, when a child learns to walk, each step she/he takes, is reinforced to encourage her/him to walk.

Thus, the learning of the response is contingent on the reinforcement that follows it. Hence, if the response is not followed by reinforcement, then the tendency to produce that response will also reduce. This process when the tendency to produce a response again and again reduces due to non-reinforcement of the response is known as **extinction**. This means that once the response is not followed by reinforcement, then it is less likely to occur in future.

Stimulus **generalization** also takes place in operant conditioning. The more similar is the new stimulus to the previous one, the more likely is the response to be reinforced. In stimulus **discrimination**, the ability to discriminate is learnt when the response elicited by one stimulus is reinforced and in the presence of another stimulus is not reinforced. Thus, reinforcers are items or events that will strengthen the response. There are two types of reinforcers, namely, **primary reinforcer** and **secondary reinforcer**. Food is an example of primary reinforcer. It fulfills the basic need of hunger motive. Money is an example of secondary reinforcer. It acquires reinforcing properties by being associated with the primary reinforcer. Thus, a child learns to use money when she/he observes that it can be exchanged (traded) for a toffee.

Skinner postulated that the timing of reinforcement is very crucial for learning. It determines the speed of the learning as well as strength of learned response. All responses should not be reinforced, for the response to be continued for a long period of time. Thus, the **schedules of reinforcement** are used in operant conditioning. In **continuous reinforcement** (CRF) every response being learnt is reinforced so that it becomes more likely to occur again. **Partial reinforcement** or intermittent

reinforcement takes place when reinforcement is not given on every desired behavior. The main types of partial reinforcement schedules (schedules of reinforcement) depend upon the time at which the reinforcement is given or the rate/number of times the reinforcement is given to the response.

i) **Fixed-ratio schedule (FR):** This depends upon a particular number of responses that must be made before the reinforcement is given. For example, reinforcement is given after every fourth response or every third response. This schedule leads to a high rate of response that occurs at a relatively steady rate.

ii) **Fixed-interval schedule (FI):** The reinforcement is given after a fixed interval of time, irrespective of the number of responses delivered. The performance is relatively varied in this kind of a schedule. The responses become fewer after the reinforcement has been given and then it slowly increases before it is the time for the next reinforcement. This tends to produce a variable rate of response during the time interval.

iii) **Variable-ratio schedule (VR):** In this schedule the reinforcement is given after a varied number of responses. That is it may be given after the first response, then after three responses, then after five responses and so on. So, there is no fixed number of responses preceding the reinforcement. This kind of reinforcement schedule leads to a high and steady rate of responding.

iv) **Variable-interval schedule (VI):** The reinforcement is given after a varied interval of time. That is to say that it may be given after one-time interval and then after another interval and so on. This causes behaviors that resist extinction as in case of VR schedules and provide steady rates of responding.

Table 3.1: An Overview of reinforcement and punishment used in instrumental conditioning

Procedure	Stimulus Event	Effects	Behavioural Outcomes
Positive reinforcement	Some desirable stimulus (e.g., food, sexual pleasure, praise)	Strengthens responses	Organism learns the response
Negative reinforcement	Some undesirable (aversive) stimulus (e.g., heat, cold, harsh criticism)	Strengthens responses that permit escape from or avoidance of stimulus	Organism learns to perform responses that permits him/her to avoid or escape from negative reinforces
Positive punishment	Something undesirable (aversive) stimulus	Weakens the responses that precede occurrence of stimulus	Organism learns to suppress responses that lead to unpleasant consequences
Negative punishment	Something desirable	Weakens responses that lead to a loss or postponement of stimulus	Organism learns to suppress responses that lead to loss or postponement of desired stimulus

Box 3.3: The principle of *Shaping* and *Chaining*

Have you seen a circus or have you watched an animal performing some tricks or stunts in a movie? How can they perform such a complicated behaviour?

The answer to this question lies in two principles of operant conditioning called as **shaping** and **chaining**. Shaping is a process of learning a new behaviour in which successively closer approximation of the desired behaviour is reinforced, that is the organism will be rewarded for each small step towards targeted behaviour.

Any complex behaviour or skill is the chain of many steps. The process of **chaining** involves breaking a task into small steps and then teaching these steps in sequence or chain. In chaining, only the targeted behaviour is rewarded, i.e., once the trainee accomplishes the last step, the person will be rewarded. For example, if you want to teach a child to use the spoon to feed himself/herself, then chaining principle can be used.

Box 3.4: Premack Principle

Given by David Premack, it is a principle of reinforcement. According to this principle, a more preferred behaviour can be used as reinforcement for a less preferred behaviour. For instance, in order to make her child develop the habit of reading, a mother tells the child that if she reads a book for 20 minutes then she could play outside for 20 minutes, The mother is using Premack principle. This is also known as 'Grandma's Rule' because the grandmother or any care giver often use this principle. Likewise, the child is asked to clean her/his room before leaving the house to play.

3.4.3 Bandura's Social Learning Theory

According to Bandura's (1977) social learning theory, learning occurs in a social setting by observing others behaviour and its outcome. This observational learning can occur in two ways: (i) direct observation, and (ii) indirect observation. In direct observation, you learn behaviour by observing others (called as model) directly, while in indirect observation you learn by observing or hearing others experiences. This kind of indirect learning is known as vicarious learning. Suppose you wanted to go on a trip to North-eastern states of India. One of your friends who recently came back from a trip of north-east suggests you to carry umbrella or raincoat, as it can rain anytime. What will you do? There are very high chances that you will listen to the other person's experience and carry an umbrella. This kind of learning is an example of vicarious learning.

Bandura's (1961) famous experiment with the bobo doll showed how behaviors can be learnt by observing others' behaviors. People whose behaviors are observed are known as models. These models provide information about how to interact with others, how to express one self, how to play, etc. Our parents, teachers, peers, TV actors, film actors, singers, sportspersons, or any significant person could serve as a model for learning behaviors that could be pro-social, as altruistic or anti-social, as criminal acts.

Box 3.5: Bobo Doll Experiment

Bandura and his colleagues conducted an experiment on children to investigate the role of observational and imitation in learning social behaviour, such as aggression. They selected 72 children between the age group of three to six years. Children were randomly assigned to three groups: one control and two experimental conditions. In one group of experimental condition, children were shown a movie with an aggressive model, beating, hitting and abusing a bobo doll. In another experimental condition, a non-aggressive model was shown playing peacefully and friendly with a bobo doll. Whereas, in control condition children were not shown any movie. Later, all groups of children were placed in a room full of varieties of toys. It was observed that children

who were exposed to aggressive model imitated the model's behaviour. They also punched, hit, and used abusive words for bobo dolls. In contrast, the children of second experimental group, who were exposed to non-aggressive model, did not demonstrate any aggression with bobo doll. This was one of the landmark studies in psychology. It suggested that observation and imitation play crucial role in learning.



Figure 3.5: Children imitating aggressive behaviour of the actor of the film
 Image Source: <https://thedirtpsychology.org/>

Bandura further suggested that whatever information the person grasps, this information is then actively processed and various cognitions are involved before the observations are displayed as expressed behaviors. These cognitive processes are as: (1) the extent to which we **attend** to the information and (2) how well we remember or **retain** the observed behavior. This is followed by how well we are able to **reproduce** the observed behavior and what **motivates** us to perform the observed behaviors.

Check Your Progress1

1) Differentiate between classical and operant conditioning?

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2) Explain learned helplessness with the help of the theory of classical conditioning.

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Figure 3.6: Tolman's maze

Image Source: <https://courses.lumenlearning.com>

3.5.2 Insight Learning

Given by one of the founders of Gestalt psychology, Wolfgang Kohler, insight learning refers to the sudden realization of a problem's solution. Kohler proposed that not all kind of learning depends on trial-error or conditioning. We also use our cognitive processes to learn. Using cognitive processes, we visualize the problem and solution for it internally. Even though this learning takes place implicitly but the change in the behaviour is long lasting.

To prove his point, Kohler conducted a series of experiment on chimpanzees, with whom the human share 99 percent DNA. In one such experiment, Kohler placed a chimpanzee in a cage and placed a banana above its reach. Initially, after a few failed attempts to get that banana, chimpanzee started spending its time unproductively by playing and sitting. Suddenly, after some time chimpanzee started piling up the kept wooden boxes on top of each other and climbed, and grabbed the banana. Kohler argued that the internal process that led the chimpanzee to use boxes in this way is an example of insight learning.



Figure 3.7: Chimpanzee trying to reach banana placed above his reach

Image Source: <http://slideplayer.com>

The famous story behind Archimedes "Eureka" moment and sudden realization of gravitational force after seeing a falling apple by Isaac Newton, are some of the most famous examples of insight learning.

3.6 STRATEGIES IN LEARNING: IMAGERY, REHEARSAL AND ORGANISATION

What could be the best way or strategy of learning information? Cognitive and educational psychologists have done extensive studies in finding out the most appropriate strategies of learning. Findings suggest that learning can be improved by using the method of imagery, rehearsal and organisation. In this section, we will discuss these strategies briefly.

1) **Mental Imagery:** Answer the following questions:

- How many windows are in your house?
- How many vowels are in the spelling of 100?

For answering the first questions, people will imagine themselves as taking a mental tour of their house and counting the number of windows. And for answering the second question, people mentally form the image of the spelling of digit 100 and count the number of vowels present in its spelling.

So, here mental imagery has helped you in answering these questions. Without the ability to produce mental images, you would have not answered it correctly. Studies have suggested that if you are capable of producing mental images of the information to be remembered, then, you can learn things more efficiently. It can be defined as one's ability to visualize the situation or information mentally. Developmental studies have suggested that older students get more benefits using this method. Learning information using imagery, involves two steps:

- 1) Reading the information to be remembered.
- 2) Mentally forming a picture of that information.

If the mental image contains all the relevant information, then it will be more accurately learned. Further, reading from a book or source having lot of details also helps in forming images and thus, improves learning.

2) **Rehearsal:** Rehearsing refers to repeating of information over and over again to order to learn it. Rehearsal can be two types: maintenance rehearsal and elaborative rehearsal. In *maintenance rehearsal*, information is simply repeated a number of times, without understanding the underlying meaning, to keep it in memory. On the other hand, *elaborative rehearsal* is a method of learning information by making an attempt to elaborate it either by understanding its underlying meaning or by making meaningful connections with other information. Studies have suggested that learning a concept or information using elaborative rehearsal method is more effective, as it helps in retaining information for longer period. One way of doing elaborative rehearsal is *elaborative interrogation*. It involves asking 'why' question for the information to be remembered and then generating an answer. Studies have suggested that this specific technique is useful in remembering facts.

3) **Organisation:** This strategy of learning requires reorganisation of information to be remembered in such a way that would facilitate learning process. For example, you were asked to remember the following list:

Delhi

Ostrich

- London
- Ludhiana
- Yak
- Greenwich
- Owl

You can either learn these items by making separate groups for city and animal names or you can create a new word by taking first alphabet from each word, such as, DOLLY-GO. This method helps of organization of information improves learning for two reasons; (i) it reduces the large number of information into manageable amount, and (ii) it helps in retrieving information more accurately.

Check Your Progress 2

Fill in the blanks

- 1) was the main proponent of latent learning.
- 2) Learning that takes place but does not express until the situation for it is conducive is known as
- 3) was the main proponent of insight learning.
- 4) refers to the sudden realization of a problem’s solution.
- 5) Findings suggest that learning can be improved using the method of imagery, and organisation.
- 6) Rehearsal can be of two types: and

(1) Tolman, (2) latent learning, (3) Wolfgang Kohler, (4) insight learning, (5) rehearsal, (6) maintenance rehearsal and elaborative rehearsal.

Answers

3.7 SUMMARY

Now that we have come to the end of this unit, let us recapitulate all the major points that we have covered.

- Learning can be defined as a “relatively permanent change in behaviour (or behaviour potential) resulting from experience”.
- Ivan Petrovich Pavlov gave principles of classical conditioning, which is also known as **respondent conditioning** or **Pavlovian conditioning**. This kind of conditioning involves pairing of two stimuli. One is called as the *Conditioned Stimulus (CS)* and the other is *Unconditioned Stimulus (UCS)*.
- Instrumental conditioning also known as operant conditioning was given by B. F. Skinner. This kind of learning involves some kind of behavior or action that is instrumental in producing reinforcement (or reward) when it operates upon the environment.
- The phenomenon of learned helplessness was given by Martin Seligman in the late 1960s while working on a classical conditioning with dogs. It can be defined

as one's tendency to avoid taking any action for a successful escape from an aversive or painful situation due to the history of failed attempts.

- According to Bandura's social learning theory, learning occurs in a social setting by observing others behaviour and its outcome. This observational learning can occur in two ways: (i) direct observation, and (ii) indirect observation.
- Learning based on cognitive processes is known as cognitive learning. Types of cognitive learning are latent learning and insight learning.
- Findings suggest that learning can be improved using the method of imagery, rehearsal and organisation.

3.8 REVIEW QUESTIONS

- 1) Blinking in response to a puff of air directed to your eye is a(n):
 - a) UCR
 - b) UCS
 - c) CR
 - d) CS
- 2) A year after surviving a classroom shooting incident, a child still responds with terror at the sight of toy guns and to the sound of balloons popping. This reaction best illustrates:
 - a) an unconditioned response.
 - b) operant conditioning.
 - c) latent learning.
 - d) generalization.
- 3) Airline frequent flyer programs that reward customers with a free flight after every 25,000 miles of travel, illustrate the use of a schedule of reinforcement.
 - a) fixed-interval
 - b) variable-interval
 - c) fixed-ratio
 - d) variable-ratio
- 4) Which pioneering learning researcher highlighted the antisocial effects of aggressive models on children's behavior?
 - a) Watson
 - b) Bandura
 - c) Pavlov
 - d) Skinner
- 5) Explain different types of learning.

- 6) Differentiate between theory of classical conditioning and operant conditioning.
- 7) Explain the principles of extinction, spontaneous recovery and reconditioning.
- 8) Describe the different types of reinforcement schedules.
- 9) Explain the phenomenon of learned helplessness and discuss how it is a form of classical conditioning.
- 10) What do you understand by the principle of shaping and chaining?
- 11) Differentiate between latent learning and insight learning.

3.9 KEY WORDS

- Classical Conditioning** : A basic form of learning in which one stimulus comes to serve as a signal for the occurrence of a second stimulus. Organisms acquire information about the relations between various stimuli, not simple associations between them.
- Operant Conditioning** : A form of learning in which behaviour is maintained or changed through its positive or negative consequences. Positive consequences lead to the repetition of behaviour, whereas, negative consequences will lead to avoidance of behaviour.
- Reinforcement** : It is any stimulus or event which increases the likelihood that the response will occur again. It could be a reward or a punishment.
- Premack Principle** : This principle states that, a more preferred behaviour can be used as reinforcement for a less preferred behaviour.
- Chaining** : The process of breaking a task into small steps and then teaching these steps in sequence or chain by rewarding only targeted behaviour is rewarded.
- Schedule of reinforcement** : Rules determining when and how reinforcement will be delivered, is known as schedule of reinforcement.

3.10 REFERENCES AND SUGGESTED READING

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3.11 REFERENCES FOR FIGURE

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- Chimpanzee trying to reach banana placed above his reach. Retrieved June 1, 2018, from <http://slideplayer.com/slide/7222286/>

3.12 ONLINE RESOURCES

- For more on Latent learning, visit
 - <https://courses.lumenlearning.com/wmopen-psychology/chapter/psychology-in-real-life-latent-learning/>
 - <https://www.psychestudy.com/behavioral/learning-memory/latent-learning>
 - <http://fac.hsu.edu/ahmada/3%20courses/2%20learning/learning%20notes/9%20tolman.pdf>
- For more information on Social Learning Theory, visit
 - http://www.asecib.ase.ro/mps/Bandura_SocialLearningTheory.pdf
 - <https://www.lsrhs.net/sites/kleina/files/2012/11/SocialLearningTheory.pdf>

- For more information on Pavlov's classical conditioning, visit
 - <https://courses.lumenlearning.com/boundless-psychology/chapter/classical-conditioning/>
 - <https://web.mst.edu/~psyworld/general/cc/cc.pdf>
 - https://courses.edx.org/c4x/SMES/PSYCH101x/asset/Chapter_7.pdf
- For more on Learned Helplessness, visit
 - <https://ppc.sas.upenn.edu/sites/default/files/learnedhelplessness.pdf>
 - <https://positivepsychologyprogram.com/learned-helplessness-seligman-theory-depression-cure/>

Answers for *Multiple Choice Questions*:

1) (a), 2) (d), 3) (c), 4) (b)

