2 Learning Skills

Psychology is a Science of behaviour. In recent study it has been found that every living being on earth has to learn to adapt to the surrounding environment and it is an inevitable process. Every living being for his own safety and sustainment has to learn something or the other skills. Learning brings change in behaviour and situation and helps man to solve different types of problems. It can be said that human being can live freely, safely and with satisfaction only because of the skill of learning.

Every human being, during his life span behaves in two ways

1. Natural behaviour 2. Learned behaviour

There is no need for any kind of formal education for natural learning, At the time of birth human baby is capable of making only a limited number of response which can be termed as in born or natural behaviour for e.g. An ant pulling a grain for its survival, a new born calf immediately starts suckling its mother, cry of a baby immediately after it is born can all said to be inborn responses.

Normally every living being to satisfy its basic needs and to safeguard itself gives out natural responses to the environment which we can call as natural behaviour. Learned behaviour means that learning which takes place by observing others or is taught to an individual by other people or stimulus in the environment. Whenever a man or animal learns something, there is a change in one's behaviour. But if this behaviour change occurs as a result of experience or practice then only it can be called as learning. Its natural for a child, as he/she grows and matures, brings a change in his behaviour pattern because of his experiences from the enviroment and also learn to adapt to the situation. Hence it can be said that learning is a continuous process from birth till death.

An Individual in his childhood acquires basic learning either by modeling or by trial and error. In adolescence his learning is based on conditioning where as problems in youth are solved by his learning and experiences of the past and its insightful application in the present situation. So it can be said that a person can learn language, behaviour, Attitude, discipline etc. through education and develop his personality.

So an individual can sail through the ocean of life successfully with help of learning and education.

What is learning? Definition and its Explanation:

According to American Psychologist C.T. Morgan, "Learning is any relatively permanent change in human or animal behaviour as a result of experience or practice." This definition throws light on three important points in learning process.

1. Experience and practice
2. Change in behaviour
3. Relatively permanent change

Let us understand in detail the above features of definition of learning.

1. Experience and practice: Whenever men or animals learn something, there is change in behaviour. But if the behavioural change is not by training, experience or practice then it can not be called as learning. One should note that behavioural changes also occur due to maturity, tiredness, diseases, injury etc. But such behavioural changes also can not be called learning. For e.g. as the child grows old it learns to crawl or turn upside down but this learning is because of growth and maturity, hence psychologists do not accept it as the

process of learning. In the same way when we cannot stand properly due to exhaustion or breaking of a bone due to injury and not being able to walk properly cannot be called learning. Any behavioural change that takes place by practice or experience can be called learning.

2. Change in behaviour: It can be called learning only when it brings change in the behaviour pattern of the individual. e.g., A child who does not know how to ride a bicycle will fall down when he tries to ride it for the first time. But with training and practice the child will learn to keep balance, paddle slowly and learn to ride a bicycle. This example clarifies that learning brings about change in behaviour.

3. Relatively permanent change : The behavioural changes produced by learning are relatively permanent. The behavioural changes that are temporary which occur because of fatigue, drug or disease cannot be called as learning. It was found in the above example that due to exhaustion, man cannot walk properly but after exhaustion when we can walk properly then such change cannot be called as learning. Instant behavioural changes which are temporary are not accepted by psychologists as learning. Only those changes which are for a long time and relatively permanent are accepted as learning. e.g., When a child tries to ride a bicycle for the first time he falls down but with practice for some days, he learns to ride the bicycle and also go to school. This is called a relatively permanent change in behaviour due to learning.

How do we learn?

After getting the idea about learning, the most important question that arise in the mind is that how does learning take place? Different types of research have been done by expert Psychologists. In relation to this many researches and experiments have been performed on humans and animals to see how learning takes place. Out of the many, we are going to study five experiments in detail.

1. Learning by Emulation(Modeling & Iimitation): Most of the learning done by a human child or animal is because of Iimitation or Emulation. Learning by emulation is called observational or social learning. Observation is the most important source for emulation. An individual learns through observation from its surrounding environment and then emulates it. e.g., a child imitating the act of filling petrol in its tricycle just as parents do it in scooter or trying to fill air in the cycle wheel and also giving money etc. All these are examples of behavioural patterns practiced by children because of learning by emulation.

A one year old child putting a mobile phone near the ear and talking is an example of learning by emulation. There are lot of examples which we can get from our daily life and social surroundings and so this learning is also called social learning. While watching TV, young girls imitate the dressing style and cosmetic usage just like the actresses. This can be called the example of learning by modeling.

2. Learning by trial & error(experiment by Thorndike)

American Psychologist Thorndike had prepared a puzzle box in such a way that when the liver inside the box is pressed then only the door would open.

- **Experiment by Thorndike**

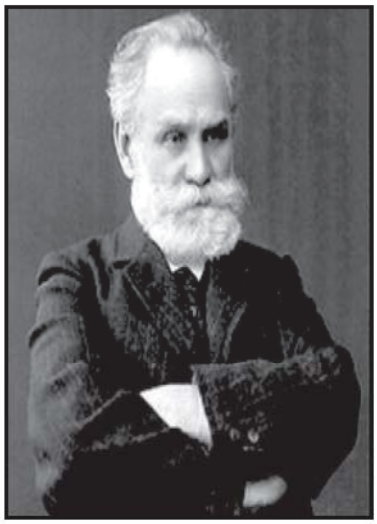
Thorndike put a hungry cat in the puzzle box and put food just outside the box in such a way that it can be seen by the hungry cat. The cat tried to come out of the puzzle box to get the food and for that it tried very hard. At first it started scratching and pulling at the bars of the puzzle box, roamed about in the puzzle box etc. The cat was trying to come out of the puzzle box but it was not successful. The cat again practiced the same kind of behaviour, eventually the cat accidentally happened to press the lever and the door of the puzzle box opened. Here the pressing of the lever by the cat was accidental and it was not aware that pressing of the lever had opened the door. So when the cat was again put back in the box, it went through a series of incorrect responses before pushing the lever. In this way Thorndike continued the experiment for 24 days and on the 24th trial when the hungry cat was put in the puzzle box it immediately pressed the lever and came out of the box. Here the cat had learned to perform the act of pressing the lever to open the door.

Basically in trial and error learning, as the trial increases, the time taken to learn and the errors both decrease. In the above experiment also, in the first trial the cat took 160 seconds to press the lever and open the door whereas in the 24th trial it took just 10 sec. to press the lever and open the door. The cat became progressively quicker at escaping from the puzzle box.

Hence in trial and error learning as trial increases, errors decreases and finally learning takes place without any error.

3. Learning by conditioning:

Conditioning means to associate. It is a pattern of learning based on association and it is the simplest method of learning. More frequent and predictable response given to a stimuli in a given situation or environment can be called as conditioning. e.g., different sound of the school bell is associated with different activities.



Ivan Petrovich Pavlov

In this kind of learning an individual experiences a series of sensations in the brain and so on presentation of a particular stimuli it evokes an response associated with it. In this way we can say that conditioning means series of experience in which presence of a stimulus also make us realize the presence of many associated stimuli.

The first investigator of this type of learning was by Russian physiologist Ivan Petrovich Pavlov(1849-1936) and he was primarily interested in the physiological aspect of digestion. Traditionally conditioning is also called as classical conditioning.

(1)Experiment on classical conditioning :

Russian physiologist Ivan Petrovich Pavlov(1849-1936) was primarily interested in study of digestion. To satisfy his curiosity he conducted various experiments on dogs during which he gained lot of information on conditioning and psychologists got the gift of classical conditioning from Pavlov. He was awarded the Nobel prize for physiology and medicine in 1904.

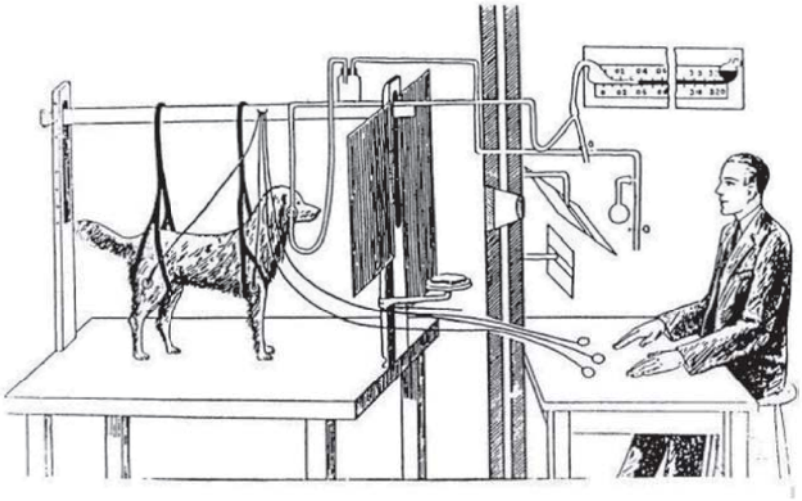


Figure 2.1 Pavlov's experiment on conditioning

Pavlov designed a special stand on which a dog was harnessed in such a way that the dripping salivia would fall in the measuring glass. Firstly Pavlov presented food before the hungry dog and the dog started saliavating which was a very natural response.

Now a bell was sounded followed by serving of food to the dog. This was repeated for some days. after a few such trials, the test trail was introduced in which everything was the same except the presentation of food. In the begining, the salivary response was noticed in response to food. But afterwards the saliva started to secrete in the presence of sound bell only. Now only at the sound of the bell and the dog started salivating. Pavlov did not stop the experiment here but he brought about changes in the presentation of stimuli to study indepth learning of classical conditioning.

(II) Important features of classical conditioning: The above experiment explains in a easier way Pavlov's classical conditioning but being students of Psychology, it is necessary to know important terms used in it.

(a) Unconditioned stimulus (UCS) : In basic terms, the stimulus which produces a response which is unlearned, natural and not taught is called as unconditioned stimulus(UCS). In Pavlov's experiment when food is presented to hungry dog its start salivating which is a natural response and so here food is said to be unconditioned stimulus.

(b) Unconditioned response (UCR) : Any response which is not associated learned or conditioned cannot be called as learned response. Any kind of physiological response which is unlearned is known as unconditioned response(UCR). In short natural response to a natural stimuli is called as UCR. In Pavlov's experiment salivation is a natural response by the dog on seeing the food i.e.(UCS). The respone of salvation is (UCR).

(c) Conditioned stimulation (CS) : Usually the conditioned stimulus is a natural stimulus. It can be said that a stimulus which is presented with the unconditioned stimulus and it helps in eliciting an unconditioned response than that stimulus is called conditioned stimulus(CS).

In initial trials of Pavlov experiment it was found that the dog started salivating on seeing the food. After a few trials first bell was sounded and than food was presented and it was noticed that the saliva started to secrete at the sound of the bell only which signifies that learning had taken place in the dog. So a stimulus that can elicit an conditioned response is called as conditioned stimulus(CS).

(d) Conditioned response (CR) : The response which was not associated with a particular stimulus before but after learning and practice, when conditioned stimulus(bell) is presented it elicits a conditioned response i.e. salivation. So in Pavlov experiment when the sound of bell made the dog salivate it become conditioned response i.e. (CR).

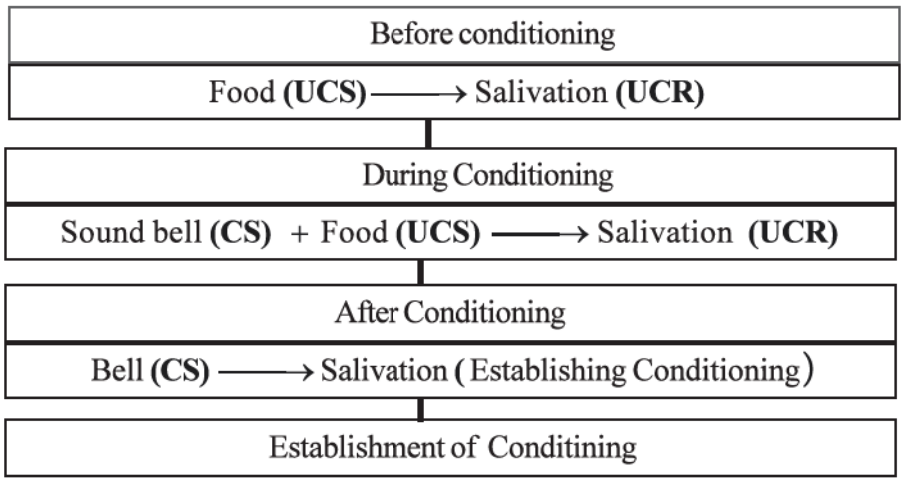


Figure 2.2 : Stages of conditiong and procedural operations.

(e) Reinforcement: Reinforcement refers to the administration of reinforcement by an experimenter. Reinforcer is any stimulus which strengthens the response. In Pavlov experiment food was the reinforcer.

(f) Extinction: If the conditioned response is not reinforced. i.e. unconditioned stimulus(food) is not presented continuously for several trials along with conditioned stimulus(bell), the conditioned response(salivation) slows down gradually and ultimately stops. This is called extinction.

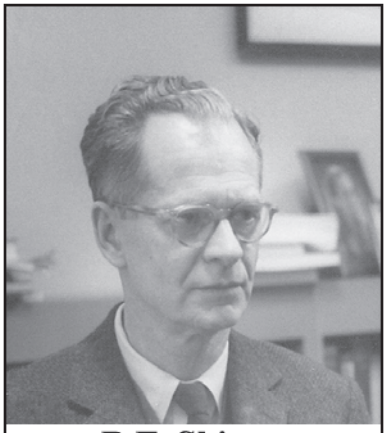
(g) Stimulus generalization: After the establishment of conditioning, the conditioned response(CR) also occurs by other stimuli similar to the conditioned stimulus(CS). It is called generalization. In Pavlov's experiment, after the establishment of conditioning of the salivary response to a bell, the dog used to salivate to the sound of electric buzzer and the sound of a metronome also.

(h) Stimulus Discrimination: To be able to differentiate between stimuli and also learn to respond to one stimuli in one way and the other stimuli in other way is called as stimulus discrimination. After stimulus generalization, if food follows the sound of bell only and does not follow the sound of buzzer, then the dog learns to differentiate between two sounds. That means saliva is secreted only at the sound of bell and not by the sound of the buzzer if this is repeated then slowly the dog will stop salivating at the sound of the buzzer because it has learned to differentiate between two sounds.

4. Skinner's experiment of operant conditioning

Just as Pavlov gave us the gift of classical conditioning in the same way American Psychologist B.F.Skinner(1904-1990) gave us the gift of learning by operant conditioning this study is slightly different from that of Pavlov. In classical conditioning man did not do any activity yet he used to get reinforcement while in operant conditioning subject will have to perform some specific activity to get the reinforcement. He studied the conditioning, voluntary responses which are under the control of animal or man. The subject will operate on the environment and hence it is called operant. In this type of conditioning man or animal has to perform a task decided by the experimenter so this type of learning is called " Instrumental conditioning".

As per skinner's experiment, by giving reinforcement whatever desired behaviour is to be taught can be done easily. For his experiment, skinner prepared a puzzle box which was called "Skinners Box". The skinner box was specially designed in such a way that rat can move inside the box but cannot come out. There was a bar(lever) in the box, which was connected with a food container, kept on the top. When the bar was pressed the food pellet would drop in the food tray.



B.F. Skinner

A hungry rat was placed in the skinner's box. In the beginning the rat kept on moving inside the box as it could not come out. It started pulling at the bars of the box, biting it, running here and there etc but while moving around and pawing the walls(exploratory behaviour) the hungry rat accidently pressed the bar and food pellet dropped into the food tray. The hungary rat ate it up. In the next trial, the exploratory behaviour started again and the rat again accidentally pressed the bar and food pellet dropped

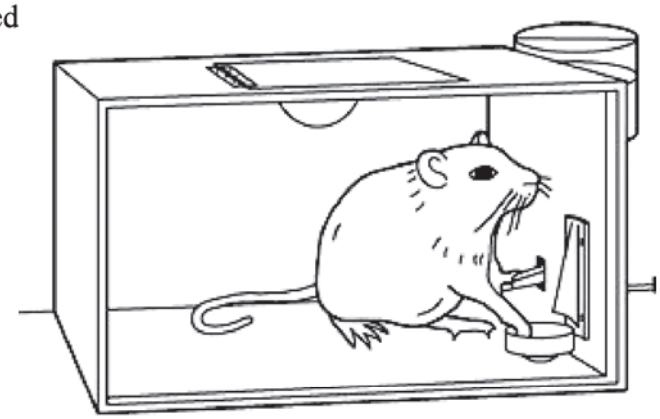


Figure 2.3 : Experiment by Skinner for Operant conditioning

In the first trial the rat got the food pellet after 15 minutes in the box. The second food pellet was obtained after 35 minutes which means that it got the food pellet after 20 minutes in the first trial. In the same way the third food pellet was obtained by the rat after 47 minutes and the fourth after 71 minutes. As the number of trials increased, the rat learned to press the bar to get food in lesser and lesser time. Now, when the hungry rat was places in the skinner box, it immediately pressed the bar and got the food pellet. Here bar pressing is an operant response and food is its reinforcement. In the above experiment the bar pressing response is instrumental in getting the food. Hence this type of learning is also known as "Instrumental conditioning".

Hence, in operant conditioning the rat accidentally learned to press the bar in the begining but with reinforcement(food) learning took place.

Determinants of operant conditioning

(a) Reinforcement : It may be defined as any stimulus or event which increase the probability of the occurance of the response. Any behaviour that is learned or changed through the consequence are called as reinforcer. In classical conditioning the food is the reinforcement because of which the dog learn to salivate where as in operant conditioning the rat learns to press the bar because the food pellet was the reinforcement.

Reinforcement is of two types (I) Positive reinforcement (II) Negative reinforcement

(i)Positive reinforcement: Positive reinforcement is a stimulus which increases the probability of response, when presented after the response. It increases the rate of response that precedes its presentation. For skinner, hungary rat gets food pellet after it presses the bar, as a result the probability of bar pressing response increases. Positive reinforcers have pleasant sequence as they strengthen and maintain the response upon which they are contingent. e.g. A mother giving a chocolate to her child on finishing his homework. Chocolate is a positive reinforcement for the child.

(ii) Negative reinforcement: Generally positive reinforcement is looked upon as a reward while negative reinforcement as punishment But as per skinner negative reinforcement cannot be considered as punishment. Negative reinforce is a stimulus which increases the probability of response, when removed after the response. So if by systamatically used it can lead to a desired response.

In operant conditioning negative reinforcement is not used as punishment but to increase the probability of escape or avoidance response. In skinners experiment supposing the pressing of the bar would have given relief from the electric shock to the rat, then to come out of the painful situation, the rat would have learned to press the bar.

Reinforcement can be positive or negative but it can be called as reinforcement only when it increases the probability of desired response in men or animal.

In operant conditioning skinner tested the effects of reinforcement on rat by changing the number, amount and quality of reinforcement, schedules of reinforcement delayed reinforcement etc to see how effective the conditioning takes place.

(b) Extinction: When any learned response gradually becomes slow and ultimately stops then it is called as extinction. After having learned the response, if the animal is not given reinforcement though it does the activity of responding then it completely stops is called as extinction.

After learning to operate an instrument in the form of response, if the animal is not given reinforcement for many trials then slowly the animals stops giving the learned response and then totally stops. It means the established conditioning gets extinct.

In skinner's box the rat has learned to press the bar to get the food pellet. Now if the rat presses the bar again and again but the food pellet is not given than rate of pressing the bar is reduced and it also stops at the end. Thus the conditioned operant response extinguishes in the absence of reinforcement.

(c) Stimulus generalization: Just as we have seen stimulus generalization in classical conditioning, its not possible in operant conditioning because in this type of conditioning the Skinners box is the main stimulus, but there are lot of example of stimulus generalization in our daily life. e.g, if you hide the toy of the child in a particular place, at first the child. it will search for it randomly and accidentally be able to find it. But when this is done again and again then the child will not search for it but will immediately go to that place and find the toy. This activity of the child takes place because of conditioning. Now even if the place is changed to hide the toy, the child will be able to find it in no time as it will associate the old place with new place and this takes place because of stimulus generalization.

(d) Stimulus discrimination: In operant conditioning experiment the rat is taught to differentiate between the two stimulus ie. presence of light and absence of light. If the rat presses the bar in the presence of light then it would get the food pellet and if presses the bar in absence of light then no food pellet for the rat. After a few trials the rat learned to discriminate between presence and absence of light. So the rat used to press the bar only in the presence of light. It was because of learning to discriminated between stimuli.

5. Learning by Insight

Learning by insight is a comprehensive act of process of learning. In which men or animal have an abrupt or sudden realization of a problems solution because of their own insight. German Gestalt Psychologist Wolfgang Kohler was the first one to conduct experiments which led to development of first cognitive theories of learning. During the world war, he performed experiment on apes and studied their behaviour on canary Island. His contribution in the theory of learning by insight is remarkable. According to Kohler, insight learning is not the result of trial and error or of observing someone else attempting the problem but it depends on the individual or animals ability to visualize the problem internally and then respond to it. Following the occurrence of insight, the realization of how to solve the problem can be repeated in future similar situation once learning takes place.

Kohler's experiment on chaimpanzees:

According to the principle of evolution lower level animal learn by Iimitation but in higher level animal learning can take place because of insight and conditioning. To study learning by insight Kohler made use of chimpanzees because as per theory of evolution they have the same structure of brain as the humans. He tried to study and observe how the chimpanzee tried to solve the problem and so lets study few of his experiments in detail.

(a) Experiment with one stick: Kohler has performed different experiments on chimpanzees where there were simple to complex problem situation. In this experiment he has tried to observe how chimpanzee solve a very simple problem. He put a hungry chimpanzees in the cage and put a brunch of bananas just outside the cage so that the chimpanzees can see it and he also put a stick in the back portion of the cage. It was obvious that the chimpanzees tried very hard to reach the bananas by pushing his hands outside the cage, he tried with legs and so on. But he was not successful so he stopped doing any activity and sat down in the cage. Suddenly he saw the stick and so he took the stick, went in front of the cage and pulled the bananas towards it with the stick. In this way the chimp succeeded in solving the problem by sudden insight when he saw the stick.

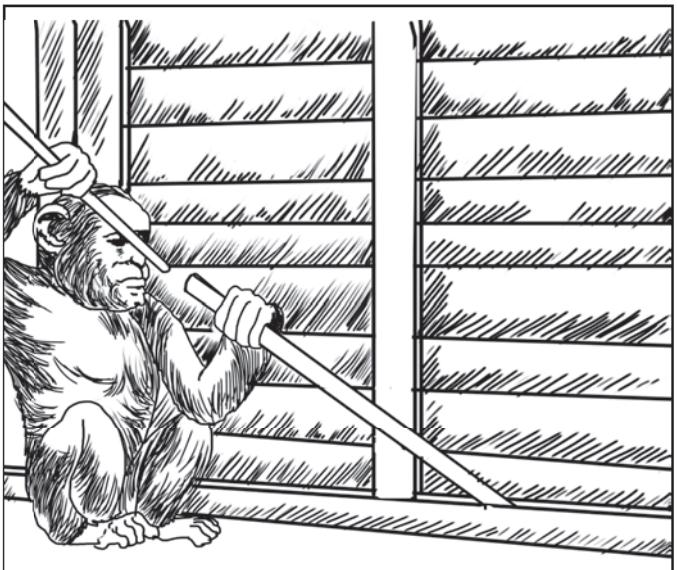


Figure 2.4 : Kohler's experiment on chimp with two sticks

(b) Experiment with two sticks:In this experiment he posed a slightly difficult problem in front of the chimpanzees. This time he put the bunch of bananas a little further away then the first time. Inside the cage he put two sticks, made in such a way that both can be joined to make one long stick. When the hungry chimp was put in the cage it started its expolatory behaviour but as soon as he saw the short stick he immediately tried to pull the bananas with the stick but was not successful in reaching it. He tried very hard to get the

bananas with the long stick, but was not able to get it. He then gave it up and started playing with the two stick. Suddenly while playing he happened to place the small into the long stick to make one very long stick. As soon as he joined the sticks he realized that now he can reach the bananas. In this way a slightly difficult problem was also solved by the chimpanzee because of his insight.

(c) Experiment with boxes: Kohler tried to test whether insightful learning can take place in chimpanzee to solve a complex problem. In this experiment Kohler put three boxes in a high ceiling room and he hung a bunch of bananas from the ceiling in the middle of the room. When the hungry chimp was put in the room, he started jumping to get the bananas. He tried very hard but all was in vain. Ultimately he saw the boxes which were there in the room. He pulled the box in the middle of the room, claimbed on it to get the bananas. One by one tried with all three boxes. But as he was not successful in getting the bananas he became sad. He kept on looking at the boxes. Suddenly by insight the chimpanzee pulled the boxes in the middle of the room and started stacking it on each other. For first few minutes he was not able to arrange it properly but the chimpanzee did not give up. He tried till he was able to arrange the boxes one upon another perfectly so that he could climb and reach the hanging bananas.

Kohler clearly tries to make us understand that how chimpanzee's early learning helped him to solve his problems by making use of available instruments' or tools. According to Kohler the process of solving a problem in a new situation begins with trials and error but later on with learning, it tries to apply it in solving the problem. According to Psychologist Harlow, insight cannot take place with past learning. Insight learning happens regularly in our lives and all around us. Inventions and innovations alike are often at times the result of insight learning. It is called as "Eureka or Aha" experience. Insight learning is also called as out of the box thinking.

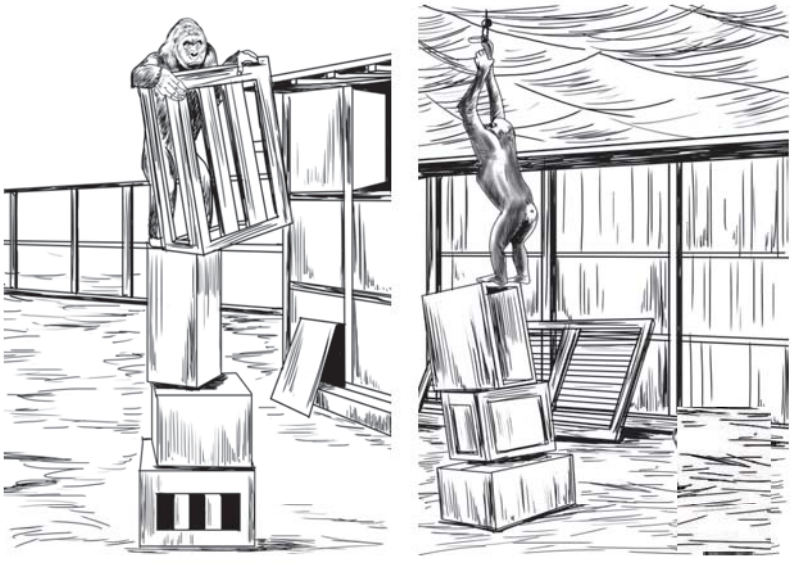


Figure 2.5 : Kohler's experiment with boxes

Hence in learning to solve a problem, if the problem situation is arranged in an organized way then it takes us closer to the solution and then by insight, problem can be solved.

In this way every living being on this earth, to survive adapts to the surrounding environment with some or the other kind of learning process. Mostly every living being uses more than one kind of learning skills to live life.

Excercises

SECTION - A

Choose the correct answer from options given and rewrite the answers :

1. What is gradual diminishing of a learned response called as?

   (a) Reinforcement (b) Extinction

   (c) Discrimination (d) Generalization

2. Which behaviour does not require any formal education and is by birth?

   (a) Learned behaviour (b) Emulative behaviour

   (c) Natural behaviour (d) Misbehaviour

3. What is a relatively permanent change in behaviour because of experience and practice called as?

   (a) Sensation (b) Attention

   (c) Learning (d) Perception

4. Who conducted experiments on learning by Trial and error?

   (a) Pavlov (b) Skinner

   (c) Thorndike (d) Watson

5. In Thorndike's experiment, How many trials did the cat take to learn?

   (a) 6 (b) 24

   (c) 12 (d) 18

6. Which Psychologists got the Nobel prize in medicine?

   (a) Pavlov (b) Kohler

   (c) Skinner (d) Thorndike

7. What is that stimulus called which elicits an unconditioned response when presented with unconditioned stimulus?

   (a) Unconditioned stimulus (b) Conditioned response

   (c) Conditioned stimulus (d) Normal stimulus

8. When stimulus is similar to another stimulus then it is called……

   (a) Stimulus- Stimulus association (b) Stimulus generalization

   (c) Extinction (d) Stimulus discrimination

9. In which type of learning animal has to respond then only it will get food?

   (a) Classical conditioning (b) Learning by observation

   (c) Operant conditioning (d) Learning by insight

10. On which animals did Kohler perform his experiment?

(a) Rat (b) Cat

(c) Dog (d) Chimpanzee

SECTION - B

Answer the following in one or two sentences each :

1. Define learning.
2. Who conducted experiment on learning by trial and error?
3. What is unconditioned response?
4. What is reinforcement?
5. State the important features of classical conditioning.
6. Who gave the concept of operant conditioning?
7. In operant conditioning when can we see extinction taking place?
8. With which type of learning "Aha" experience is associated?
9. With which School of Psychology Kohler is associated?
10. On which island Kohler conducted the experiment on chimpanzee?

SECTION - C

Answer the following in about 30 words :

1. Explain with example relatively permanent change.
2. What is positive reinforcement?
3. Explain conditioned stimulus and conditioned response.
4. Explain extinction in classical conditioning.
5. State the types of learning.
6. Explain the puzzle box used in operant conditioning.
7. Explain the relation between animal and reinforcement in operant conditioning.
8. When does the rat learn stimulus discrimination in operant conditioning?
9. Who conducted experiment in learning by insight and on whom?
10. What kind of behaviour is seen in living being during their life span?

SECTION - D

Answer the following in about 50 words :

1. Explain with example learning by emulation.
2. Explain Thorndike's experiment.
3. Explain with example stimulus generalization in classical conditioning
4. What is stimulus discrimination in classical conditioning?

5. How are classical conditioning and operant conditioning different instrengthening the response?
6. Explain Kohler's experiment on chimpanzee with boxes.
7. Explain with examples types of reinforcement.
8. In reading, which three aspects are important? Explain.
9. Explain the important features of classical conditioning.
10. Explain Kohler's experiment with one stick conducted on chimpanzee.

SECTION - E

Answer the following questations in about 80 words :

1. State the definition of learning and explain it in detail.
2. Explain the importance of advancement in trials in Thorndike's experiment.
3. Explain Pavlov's classical conditioning.
4. Explain Skinner's puzzle box and how it's used in the process of experiment.
5. State the experiments conducted by Kohler on chimpanzee and explain the experiment with two sticks.

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