



**GENERAL PSYCHOLOGY**

**School of Social Sciences**  
**Indira Gandhi National Open University**

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## COURSE INTRODUCTION

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The Course of Introduction to Psychology is one of the courses of First Semester of BA (Honours) Psychology. The attempt of this course is to explain you the meaning and concept of psychology. It also explains the human behavior and their cognitive processes; biological processes and affective processes that make them behave differently.

The first block of this course is **Introduction to psychology** which discusses the origin of the field of psychology and the emergence of psychology as an independent Discipline in the world including India. The second block of this course is- **Perception** which explains the steps and process of perception. It also explains how our perception is influenced by other factors.

The third block of this course is- **Thinking and language** which deals with the process of thinking and concept of creativity. The fourth block of this course is- **Learning and Memory** which will deal with the definition, process, stages and theories of learning and memory. In the last block of **Motivation and Emotion**, you will be introduced with the concept and theories related to motivation and emotion.



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**Block 4**  
**Learning and Memory**

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## BLOCK 4 LEARNING AND MEMORY

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### Introduction

The fourth block of this course comprises of two units. *The first unit* of the block deals with the meaning, concept and theories of learning. In this unit, you will come to know about the nature of learning and its various forms. Major theories of learning namely, the theory of classical conditioning, operant conditioning, observational learning, and cognitive learning will be covered in detail. You will also be informed about the three strategies (mental imagery, rehearsal, and organization) which are used in the process of learning. The unit also explains the effect of contemporary digital world on the process of learning.

*The second unit* of this block deals with the concept, nature and related aspects of memory. Memory refers to the ability to retain information and reproduce it over a period of time when required to perform a cognitive task. The unit will discuss about the different types and models of memory. Further, it also discusses why we sometimes fail to retrieve the required information, leading to memory failure. Various theories explaining the cause of forgetting will also be discussed. Lastly, the role of memory in our daily life will be discussed in this unit.



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## UNIT 6 LEARNING\*

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### Content

- 6.0 Introduction
- 6.1 Objectives
- 6.2 Nature and Scope of Learning
  - 6.2.1 Types of Learning
    - 6.2.1.1 Motor Learning
    - 6.2.1.2 Verbal Learning
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- 6.3 Theories of Learning
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- 6.5 Learning in a Digital World
- 6.6 Let Us Sum Up
- 6.7 Unit End Questions
- 6.8 Glossary
- 6.9 Answers to Self Assessment Questions (SAQ)
- 6.10 References and Suggested Readings

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## 6.0 INTRODUCTION

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Do you remember getting an injection as a kid? As soon as you or any other kid starts crying while getting an injection, most of the kids witnessing this event will also start crying. But why other kids start crying even before actually getting an injection? Because kids have observed and learned from others experience

that ‘injection hurts’. The phenomenon of acquiring a behavioural pattern (such as crying after seeing an injection) due to some previous experience has been termed by psychologists as **learning**. Present unit has been divided into two sections. In the first section, we will examine different theories of learning, the strategies we use in learning. We will also discuss how learning takes place in the digital world. Then we will move to the second section: memory. We will learn about different types and models of memory, then the concept of forgetting and lastly we will discuss different methods of improving our memory.



**Fig. 6.1: Kids getting shots**

*Source:* Retrieved from <http://www.smosh.com>

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## 6.1 OBJECTIVES

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After finishing this Unit, you will be able to:

- Explain the nature and scope of learning;
- Describe the different types of learning;
- Discuss the theories of learning;
- Identify the process involved in learning strategies; and
- Discuss the effects of media on learning.

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## 6.2 NATURE AND SCOPE OF LEARNING

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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 points of this definition require clarification. First, as written in definition ‘relatively permanent change’, it is important to mention here that any temporary change in behaviour can 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, will not be considered as learning. Third, here ‘experience’ does not mean our own experience only. Learning can also occur through vicarious



learning, i.e., by other's experiences. Now, the question is why we 'learn'? What is the use of the process called 'learning'. The reason is, it helps us in adaption and thus in survival. Learning can be of many types. Some of the most important types of learning have been discussed in the following section.

## **6.2.1 Types of Learning**

### **6.2.1.1 Motor Learning**

Motor learning involves acquiring of 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.

### **6.2.1.2 Verbal Learning**

It involves acquiring skills to communicate with other by using words, sounds, pictures, etc.

### **6.2.1.3 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 and a tail animal as a 'dog', is the part of concept learning. We have learned that the word dog refers to this particular type of described animal.

### **6.2.1.4 Discrimination Learning**

Our ability to discriminate between stimuli and giving response accordingly is known as discrimination learning. For example, our ability to discriminate vehicles based on its horns.

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## **6.3 THEORIES OF LEARNING**

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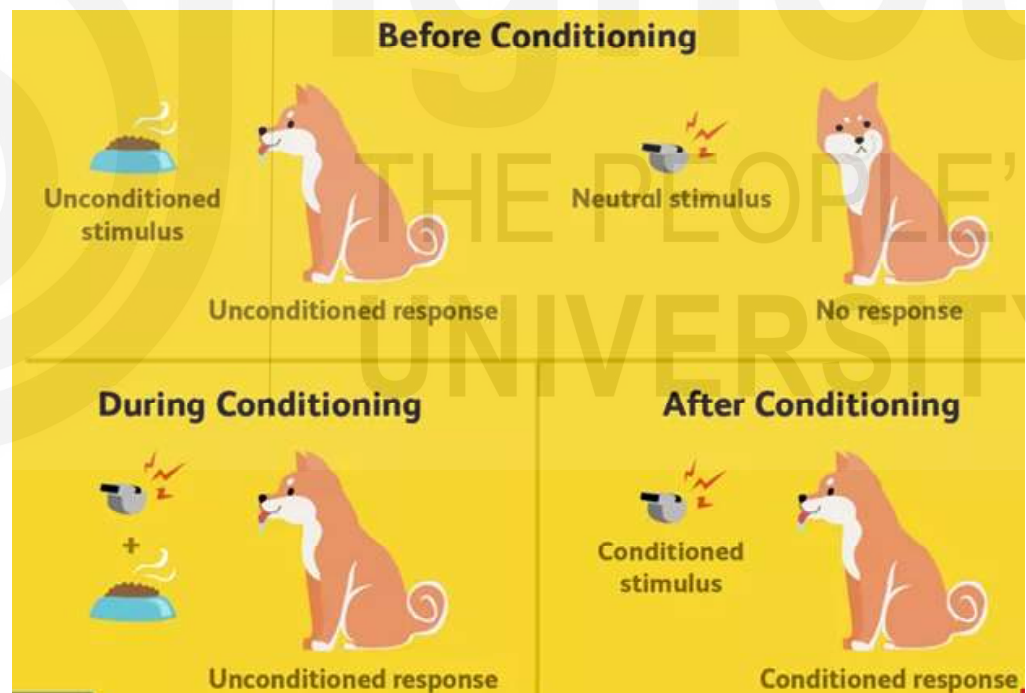
In this section, we will discuss various theories explaining the psychological processes involved in learning. Broadly, theories of learning can be categorized based on the following:

- 1) Learning by association: Known as classical conditioning
- 2) Learning by consequence: Known as operant or instrumental conditioning
- 3) Learning by watching others: Known as observational learning
- 4) Learning by higher mental processes: Known as cognitive learning.

### **6.3.1 Classical Conditioning: Learning by Association**

Theory of classical conditioning was proposed by Ivan Pavlov. According to classical conditioning, we learn by making associations and relationships among various stimuli. Baron (2001), have described classical conditioning as "A basic form of learning in which one stimulus comes to serve as a signal for the occurrence of a second stimulus. During classical conditioning, organisms acquire information about the relations between various stimuli, not simple associations between them." The subjects of learning in this theory are always some kind of automatic, involuntary or reflexive responses such as heart rate, salivation, vomiting, pupil dilatation etc.

Before moving further first we should know the famous experiment done by Ivan Pavlov. His experiment on dog laid the foundation of Classical conditioning. Pavlov, a physiologist by profession, was working on the process of digestion on dogs around 1889. While measuring the salivation rate of dogs, he observed that his dogs often began to salivate when they smell the food or even at the sight of their empty food pan. That is, they start salivating before they actually tasted the food. To understand this interesting observation he conducted a study. He conducted his study in two trials. He called his first trial as *conditioning trial*. During this trial, he presented a neutral stimulus-a bell-that had no effect on dog's salivation. The ringing of a bell was immediately followed by an **unconditioned stimulus (UCS)**-food-that can produce dog's salivation. The response that the dog gave after getting food (unconditional stimulus) in the form of salivation was termed as **an unconditioned response (UCR)**, because it did not depend on previous learning. This pairing of the ringing of a bell followed by food was done for a number of times. After this repetitive pairing, neutral stimulus i.e., bell acquired the characteristics of UCS i.e., food. Finally, Pavlov's dog started giving a **conditioned response (CR)**, i.e., it started salivating in the response to the sound of the bell only. The neutral stimulus used by Pavlov in his experiment, i.e., the bell was termed by him as a **conditioned stimulus (CS)**, because initially, the bell had no characteristics of producing salivation in the dog but later under certain condition it acquired the ability to produce salivation in the dog.



**Fig. 6.2: Experiment of classical conditioning**

*Source:* <https://www.verywellmind.com>

Now let us have a quick review of important terms:

*Unconditioned Stimulus (UCS):* A stimulus that can produce response unconditionally and naturally, whenever it is presented. For example, cutting up 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 becomes able of predicting a UCS and thus could 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 an onion and ‘sneezing’ are the examples of UCR.

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

### 6.3.1.1 Some Principles of Classical Conditioning

*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 Discrimination*

Suppose that Pavlov’s dog also salivates in response to the doorbell, metronome sound as well as the bell of his wall clock, then this phenomenon will be called as **stimulus generalization**—the tendency to make same response to stimuli similar to a conditioned stimulus. On the contrary, if Pavlov’s dog responds to the bell used in the experiment only and ignores other similar sounded bell then this phenomenon will be called as **stimulus discrimination**—tendency to make a response to certain stimulus and ignore others.

### 6.3.1.2 The Little Albert Experiment

Can we apply the principle of Classical Conditioning to human learning also? To answer this, John B. Watson conducted an experiment on a nine-month child named “Albert B”, also famously known as Little Albert. Watson hypothesized that a 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. During the baseline condition of the experiment, Watson and his assistants exposed little Albert to a number of stimuli such as a white rat, a rabbit, mask etc. As expected, the little Albert did not show any fearful response to these objects. In the control condition, when Albert was exposed to the rat, Albert made a loud noise. This made Albert fearful and he started crying. After a repeated presentation of a white rat with a loud noise, he

began to cry just after seeing the rat. Later, it was observed that Albert has started to generalize his fear of similar looking white and furry objects. Here,

*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



**Fig.6.3:** Rat or rabbit, I don't like it

*Source:* Retrieved from <https://www.newscientist.com>

### 6.3.1.3 Learned Helplessness



**Fig.6.4:** 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.

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.

### 6.3.2 Operant Conditioning: Consequence Based Learning

Suppose you want to use principles of classical conditioning to teach a child to write. For this, first, you need to identify an unconditional stimulus that will make the child write. But since, writing is not a reflex or any emotional behaviour; therefore we cannot use classical conditioning to make someone learn writing. In this situation, we should explore another form of conditioning called *operant conditioning*. In operant conditioning, the end result or consequence of behaviour determine if it will be repeated in the future or not. Operant conditioning can be defined as a principle of learning in which behaviour is maintained or changed through its positive or negative consequences. According to the principles of operant conditioning, positive consequences lead to the repetition of behaviour, whereas, negative consequences will lead to avoidance of behaviour. Factors that increase the probability of repetition of behaviour have been termed as **reinforcement**. Whereas, factors that weaken or suppresses the targeted behaviour has been termed as **punishment**.

B.F. Skinner was the main proponent of operant conditioning. He studied the learning mechanism involved in voluntary behaviour. Since voluntary behaviour occurred when an organism 'operates on the environment', he termed such voluntary behaviour as operant. Thus, conditioning of operant behaviour is known as operant conditioning. Skinner's work was inspired by Thorndike's principle of the **law of effect**, which states that behaviour followed by pleasant outcomes

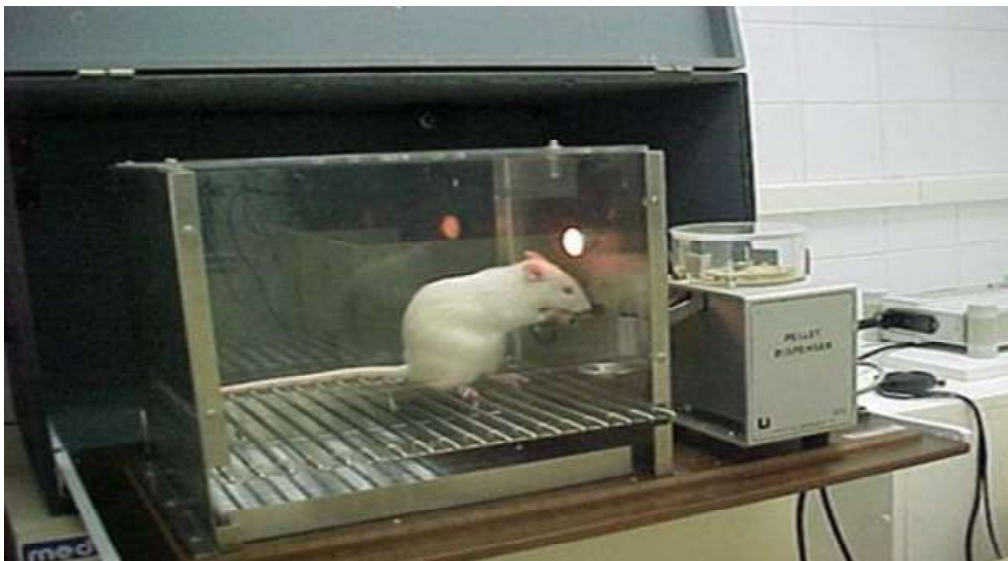


Fig.6.5: A Skinner's rat

are likely to be repeated, and behaviour followed by unpleasant are outcomes likely to be stopped. Now let's talk about the experiment done by Skinner. In his experiment, Skinner kept a hungry rat inside a closed chamber. The chamber has a lever, which was connected to a food container kept outside. During exploratory behaviour, initially, rat pressed the lever accidentally, leading to dropping off a food pellet. After a number of such accidental trials, rat learned the behaviour of pressing the lever for a food pellet. Conditioning was complete, when the rat presses the lever immediately after it food was placed in the chamber. Here, lever pressing is an operant behaviour and getting food is its consequence. Since in this experiment, the behaviour of pressing the lever was a medium or instrument of obtaining food, this type of learning is also known as **instrumental learning**.

### 6.3.2.1 An Overview of Reinforcement and Punishment

**Table 6.1: Overview of the type of reinforcement and punishment**

Procedure	Stimulus Event	Effects	Behavioural Outcomes
Positive reinforcement	Application of a desirable stimulus (e.g., food, sexual pleasure, praise)	Strengthens responses that precede the occurrence of the stimulus	Organisms learn to perform responses that produce positive reinforces
Negative reinforcement	Application of an undesirable (aversive) stimulus (e.g., heat, cold, harsh criticism)	Strengthens responses that permit escape from or avoidance of stimulus	Organisms learn to perform responses that permit them to avoid or escape from negative reinforces
Positive punishment	Application of an undesirable (aversive) stimulus	Weakens the responses that precede the occurrence of a stimulus	Organisms learn to suppress responses that lead to unpleasant consequences
Negative punishment	Lose or postponement of a desirable stimulus	Weakens responses that lead to a loss or postponement of stimulus	Organisms learn to suppress responses that lead to loss or postponement of the desired stimulus

*Source:* Baron (2001)

### 6.3.2.2 Schedules of Reinforcement

In real life, it is not necessary that you will be reinforced every time. Sometimes, your teacher praises you, sometimes she just acknowledges you, while on the other occasions she prefers to ignore your hard work. This suggests that there is no fixed rule of giving reinforcement. Psychologists have also suggested that there can be many ways of giving reinforcement and how reinforcement has been received also affects behaviour. Here, we will talk about the **schedule of reinforcement**-“rules determining when and how reinforcement will be delivered” (Baron 2001).

Table 6.2: Schedule of Reinforcement

Reinforcement Schedule	Explanation	Real-world example
Fixed-ratio	Behaviour is reinforced after a specific number of responses	Factory workers who are paid according to the number of products they produce
Variable-ratio	Behaviour is reinforced after an average, but unpredictable, number of responses	Payoffs from slot machines and other games of chance
Fixed-interval	Behaviour is reinforced for the first response after a specific amount of time has passed	People who earn a monthly salary
Variable-interval	Behaviour is reinforced for the first response after an average, but unpredictable, amount of time has passed	A person who checks voice mail for messages

Retrieved from <http://open.lib.umn.edu/intropsyc/chapter/7-2-changing-behavior-through-reinforcement-and-punishment-operant-conditioning/>

### 6.3.2.3 The Principle of Shaping and Chaining

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



Fig.6.6: A dog doing a trick

Source: Retrieved from <https://techcrunch.com>

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 he will be rewarded. For example, if

you want to teach a child to use the spoon to feed himself then the chaining principle can be used.

### 6.3.2.4 Premack Principle

Given by David Premack, according to this principle, a more preferred behaviour can be used as reinforcement for a less preferred behaviour. One of the example of the usage of Premack principle can be best explained in a circumstance where, in order to develop a habit of reading in the child, the mother promises her child to allow him/her to play outside provided the child reads for a time period of 20 minutes.

### 6.3.3 Observational Learning: Learning by Observation

The main proponent of observational learning was Albert Bandura. Unlike classical conditioning and operant conditioning, according to observational learning the cognitive processes plays important role in learning behaviour. Based on his work with phobic patients and the famous Bobo doll experiment (1963), Bandura propounded ‘Social Learning Theory’. According to 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 a 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 the North-eastern states of India. One of your friends who recently came back from his trip of north-east suggests you to carry an umbrella or raincoat, as it can rain anytime. What will you do? There are very high chances that you will listen to his experience and carry an umbrella. This kind of learning is an example of vicarious learning.



Fig.6.7: Children imitating the aggressive behaviour of the actor in the film

Source: <https://thedirtpsychology.org/>



Now, we will discuss the famous bobo-doll experiment to have an in-depth understanding of observational learning. 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 experiment 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 in a friendly way 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 the aggressive model imitated the model's behaviour. They also punched, hit, and used abusive words for Bobo dolls. In contrast, the children of the 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 a crucial role in learning.

### 6.3.3.1 Process Involved in Observational Learning

- *Attention:* In order to learn, one needs to focus his or her attention on a model. This process is influenced by the characteristics of the model as well as characteristics of the observer.
- *Retention:* It is important to remember the observed behaviour for future reproduction. This process depends on one's ability to rehearse and mentally represent the observed behaviour.
- *Production:* In the third step, learned behaviour is produced by the observer. However, production of a retained behaviour depends on the capability to perform it, i.e., whether the observer possesses the required skills or not.
- *Motivation:* An observed behaviour will be performed only when there is an appropriate motivation or reason to do so.

#### Self Assessment Questions (SAQ-I)

Fill in the following blanks

- 1) The main proponent of observational learning was .....
- 2) The process of ..... involves breaking a task into small steps and then teaching these steps in sequence or chain.
- 3) In a ....., behaviour is reinforced after a specific number of responses.
- 4) ..... can be defined as a principle of learning in which behaviour is maintained or changed through its positive or negative consequences.
- 5) ..... refers to one's learned response to not to take any appropriate action to avoid aversive stimuli.

### 6.3.4 Cognitive Learning

Many psychologists proposed that explanation of learning behaviour based on simple stimulus-response association is not appropriate. Since both humans and animals possess brain, therefore learning without higher mental processes is not possible. Learning based on cognitive processes is known as cognitive learning. In this section, we will discuss two prominent forms of cognitive learning: latent learning and insight learning.

#### 6.3.4.1 Latent Learning

Tolman was the main proponent of latent learning. Even though he was a behaviorist, but unlike others, he accepted the role of cognition in learning. Tolman and his colleagues (Tolman & Honzik, 1930; Tolman, Ritchie, & Kalish, 1946) in a series of an experiment on rats demonstrated that learning can take place without immediate reinforcement.

In a study by Tolman and Honzik (1930), hungry rats were trained to run in a maze. They took three groups of rats; reward group, no-reward group and, no-reward/reward group. For the first group, they placed hungry rats in a complicated maze with food at the end, while the second group never received any food after coming out of the maze successfully. Rats of the third group received no food for the first ten sessions but for their eleventh session, they received food as reinforcement. Results suggest that rats of the first group took lesser time for every next trial to reach their goal while the rats of the second group showed very slight improvement in their time and errors. Interestingly, rats of the third group initially also showed very slight improvement in their error but once they became aware of the presence of food by its smell, their performance improved dramatically and in fact it was on par with the performance of rats of the first group. This change in behaviour was attributed to **latent learning**: learning that takes place but does not express until the situation for it is conducive.

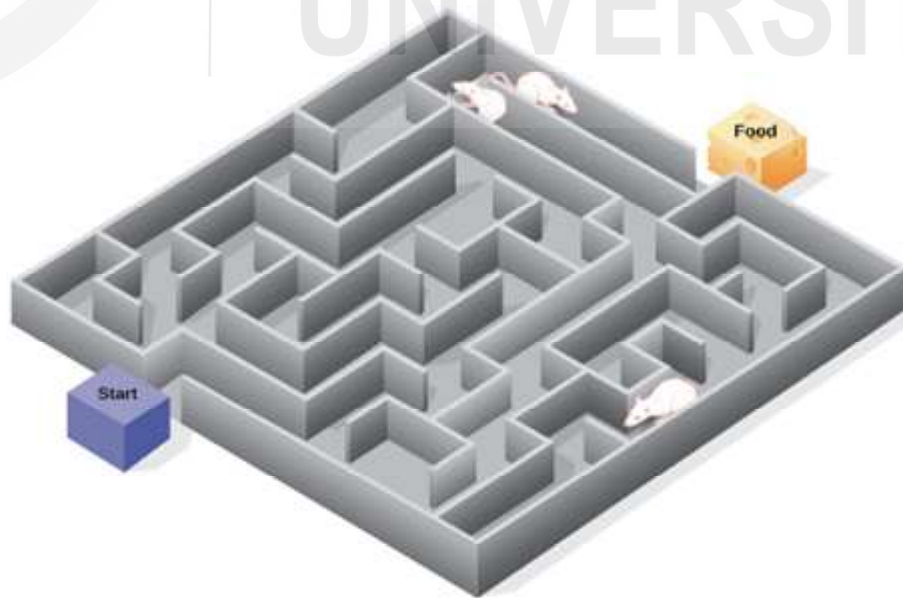
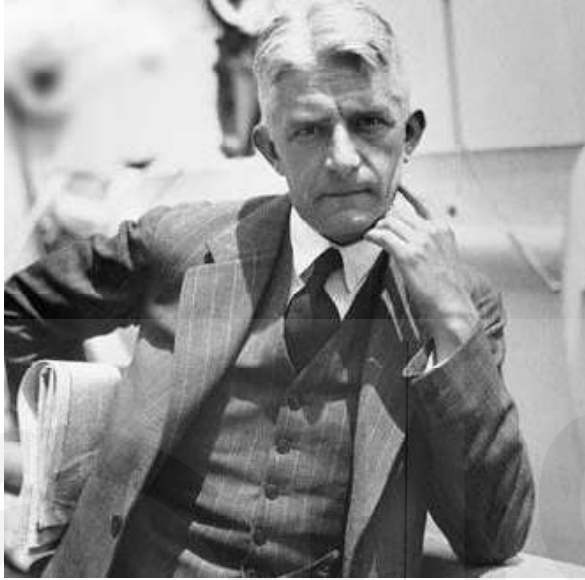


Fig. 6.8: Tolman's maze

Source: Retrieved from <https://courses.lumenlearning.com>

### 6.3.4.2 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 depend on trial-error or conditioning, we use our cognitive processes also to learn. Using cognitive processes we visualize the problem and solution for it internally only. Even though this learning takes place implicitly but the change in the behaviour is long lasting.



**Fig.6.9: Wolfgang Köhler**

Source: <https://www.psychestudy.com>

To prove his point, he conducted a series of an experiment on chimpanzees, with which we human share 99 per cent of 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 leads the chimpanzee to use boxes in this way is an example of insight learning.



**Fig. 6.10: Chimpanzee trying to reach banana placed above his reach**

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.

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## 6.4 STRATEGIES IN LEARNING: IMAGERY, REHEARSAL AND ORGANISATION

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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 for learning. Findings suggest that learning can be improved using the method of imagery, rehearsal, and organisation. In this section, we will discuss these strategies briefly.

### 6.4.1 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, most people have imaged themselves as taking a mental tour of their house and counting the number of windows. And for answering the second question, people have mentally formed the image of the spelling of digit 100 and counted 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 visualise the situation or information mentally. Developmental studies have suggested that older students can get more benefits by 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 a lot of details also help in forming images and thus improves learning.

### 6.4.2 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 the 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.

### 6.4.3 Organisation

This strategy of learning requires re-organisation of information to be remembered in such a way that would facilitate the 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 the first alphabet from each word, such as DOLLY-GO. This method helps in improving learning in two ways; (i) it reduces a large amount of information into the manageable amount, and (ii) it helps in retrieving information more accurately.

## 6.5 LEARNING IN A DIGITAL WORLD

There is no doubt that today's age is the age of computers and the internet. Everything and everyone is connected through the internet, thus, affecting all spheres of one's life including leaning and education. With the entry of Byju's-a learning app, in the Indian market, digital learning is getting more acceptances from today's generation. Digital Learning can be defined as "learning facilitated by technology that gives students some element of control over time, place, path and/or pace" (Florida Virtual School). Here it is important to elaborate terms, "time, place, path and/or pace".

*Control over time:* It refers to the possibility of not restricted by the timings of school or college. One can learn anytime.

*Control over the place:* It means learning is not restricted to any specific school or class.



Fig. 6.11: Advertisement of BYJU'S-a learning app

Source: <https://startupbase.in/case-study-byjus-the-learning-app/>

*Control over path:* The process of learning is not dependent on the pedagogy used by the teachers. Instead, one can learn from available software, mobile apps and available video on the internet.

*Control over pace:* One can spend more time on one topic and ignore other, according to one's will. The pace of learning can be adjusted by the student according to his or her need.

Studies on the effect of digital learning have yielded mixed results. According to the one section of the researchers, it positively affects the learning process while according to other, it hampers learning. First, the positive effects of digital learning will be discussed here. In a recent study, it was found that students using technologies to study physiology performed much better in their academics than those who did not seek any digital help (Al-Hariri & Al-Hattami, 2017). Now, the question is how it facilitates better learning? Studies have suggested that when learning takes place in shorter and frequent episodes, then it leads to retention of information for a longer period (Benjamin and Tullis, 2010). Digital learning enables students to go through information more frequently, according to their own convenience than the traditional non-digital method (Holzinger et al., 2009). These frequent revisions of information lead to better mastery among learners.

With the advancement of digital technologies for studying, many social networking sites and apps also came into existence. Studies have suggested that reading digitally makes you more multitasking but with a negative connotation. In a study in the U.S. A. suggests that while studying digitally, students tend to visit social networking sites and shopping sites more frequently than studying using books or print material (Baron, 2017). A survey was conducted on teachers to study their perception of the effect of the digital tool on learning, it was reported that they also feel that today's generation has a lesser span of attention and can easily get distracted (Baron, 2015). Thus directly affecting our concentration negatively. Further, digital reading, such as using e-books or using Kindle, also negatively affects your ability to give answers to the abstract question (Kaufman and Flanagan, 2016). Further, it promotes hyper reading- reading that aims "to conserve attention by quickly identifying relevant information so that only relatively few portions of a given text are actually read" (Katherine Hayles,2012, pp. 12).

**Self Assessment Questions (SAQ-II)**

State whether the following are 'True' or 'False':

- 1) If the mental image contains all the relevant information, then, it will be less accurately learned. ....
- 2) Rehearsing refers to repeating of information over and over again to order to learn it. ....
- 3) Sudden realization of gravitational force after seeing a falling apple by Isaac Newton are some of the most famous examples of insight learning...
- 4) Learning based on cognitive processes is known as cognitive learning. ....
- 5) The operant conditioning principle states that a more preferred behaviour can be used as reinforcement for a less preferred behaviour.....  
.....

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## 6.6 LET US SUM UP

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In this unit, we have discussed the nature of learning and its various forms. Major theories of learning namely, the theory of classical conditioning, operant conditioning, observational learning, and cognitive learning were covered in detail. We further discussed three strategies (mental imagery, rehearsal, and organization) used in the process of learning. The section of the present unit explains how our process of learning is getting affected by the contemporary digital world. Lastly, we discussed its both positive and negative effects with the help of recent studies.

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## 6.7 UNIT END QUESTIONS

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- 1) Explain different types of learning.
- 2) Differentiate between the theory of classical conditioning and operant conditioning.
- 3) Explain: extinction, spontaneous recovery and reconditioning.
- 4) Write a short note on different types of reinforcement schedule proposed by the theory of operant conditioning.
- 5) Explain the phenomenon of learned helplessness and discuss how is it a form of classical conditioning.
- 6) What do you understand by the principle of shaping and chaining?
- 7) Write a note on latent learning and insight learning. Also, differentiate between these two types of learning.
- 8) How learning in the digital world has affected our learning? Explain.

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## 6.8 GLOSSARY

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- Classical Conditioning** : A basic form of learning in which one stimulus comes to serve as a signal for the occurrence of a second stimulus. During classical conditioning, organisms acquire information about the relations between various stimuli, not just 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.
- 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 the schedule of reinforcement.

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## 6.9 ANSWERS TO SELF ASSESSMENT QUESTIONS (SAQ)

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### SAQ-I

- 1) Albert Bandura
- 2) chaining
- 3) fixed ratio schedule
- 4) Operant conditioning
- 5) Learned helplessness

### SAQ-II

- 1) False
- 2) True
- 3) True
- 4) True
- 5) False

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## UNIT 7 MEMORY

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### Content

- 7.0 Introduction
- 7.1 Objectives
- 7.2 Nature and Scope of Memory
- 7.3 Types of Memory
  - 7.3.1 Declarative or Explicit Memory
  - 7.3.2 Non-declarative or Implicit Memory
  - 7.3.3 Sensory Memory
- 7.4 Models of Memory
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## 7.0 INTRODUCTION

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Fig. 7.1: Memory can be tricky sometimes!

Source: <https://robekworld.com>

It is not just the story of Garfield only, you might also have experienced a similar situation. Memory is tricky because it has mysterious nature. Psychologists have also tried to uncover its mystery and investigated how it affects human behaviour. In this unit, we are going to discuss various aspects of memory such as its nature, types and, different models to understand its structure. We will further see why sometimes our memory betrays us and what are the different ways to reduce these memory failures.

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## 7.1 OBJECTIVES

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After studying this Unit, you will be able to:

- Explain the concept of memory and its nature;
- Discuss the different types of memory;
- Evaluate the various models of memory;
- Discuss the concept of forgetting and different theories explaining it;
- Identify various strategies for enhancing memory; and
- Describe the autobiographical memory, false memory, and flashbulb memory.

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## 7.2 NATURE AND SCOPE OF MEMORY

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What did you eat in dinner yesterday? What is the name of your best friend? Do you know how to drive a car or a cycle? How did you feel when you got the highest marks in your high school? The mental process you used to answer all of these questions is known as **memory**. It refers to the ability to retain information and reproducing it over a period of time when required to perform a cognitive task. It has been conceptualised as a process comprised of three stages; (i) encoding, (ii) storage, and (iii) retrieval. All information received by our senses goes through these stages.

- i) **Encoding:** It is the process of converting sensory information into a form that can be processed further by the memory systems.
- ii) **Storage:** In this second stage, received information from memory systems are stored so that it can be used at a later time also, and
- iii) **Retrieval:** It refers to locating and bringing the stored material information to one's awareness when required to complete a task.

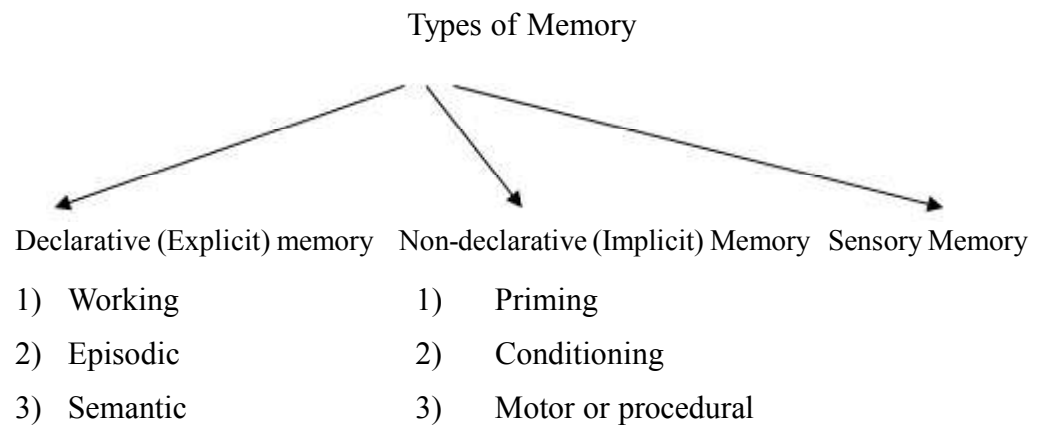
However, any issue or hindrance in the completion of any of these stages can lead to memory failure.

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## 7.3 TYPES OF MEMORY

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There is no single region in the brain responsible for memory, instead different parts of the brain are responsible for memories of different types. In this section, we will talk about the different types of memory.



**Fig. 7.2: Diagram showing different types of memory**

### 7.3.1 Declarative or Explicit Memory

It refers to that memory system which can be controlled consciously and for which we are aware of in some form. It involves effort and intention, and it generally declines with the age. Recalling the name of a friend, remembering a contact number or ATM pin involves declarative memory. Following are its three subsystems:

1) *Working memory*

It can be considered as a benchmark of consciousness. This system of memory is responsible for processing and storing of information needed for immediate use. Such as, remembering a phone number when dialling it on a landline, solving a mathematical problem involves working memory or listening to a speech.

2) *Semantic memory*

The word semantic refers to meaning or logic. This subsystem of memory stores knowledge about the world, facts, concepts, logic, and meaning associated with the words or symbols.

3) *Episodic memory*

The memory associated with our experiences or life events is called as episodic memory. It is used to recall past events, such as, how did you celebrate your last birthday? What did you eat at today's breakfast?

### 7.3.2 Non-declarative or Implicit Memory

That system of memory for which we pose no awareness. It works unconsciously and without any efforts and intentions. It is unaffected by aging. Following are its three forms:

1) *Priming*

It is the process that works unconsciously and helps in speeding up the process of retrieving. This process suggests that memory can be activated unconsciously also.

2) *Conditioning*

As already discussed in the previous unit, that this form of memory is responsible for learning an association between two stimuli.

### 3) *Motor/Procedural memory*

The process of learning a motor skill is slow but once it is well learned it becomes automatic in nature. That is, it does not need any further attention or conscious effort. Such as the motor process involved in walking does not need any conscious effort.

### 7.3.3 Sensory Memory

Sensory memory, which is also known as ‘fleeting memory’ sometimes, is closely related to the process of perception. It is responsible for keeping a record of our percept for a very brief period of time. It is important to note here that our sensory register works as a memory system. The information from the environment first reaches sensory memory and if required attention is given to the information, it moves to other memory systems. It can store information only for 200-500 milliseconds. Psychologists have argued that there is a visual sensory memory, an auditory sensory memory, an olfactory (smell) sensory memory, a gustatory (taste) sensory memory, and a tactile (touch) sensory memory. However, a bulk of literature is available on *iconic* sensory memory – the memory for visual inputs and *echoic* sensory memory – the memory for auditory inputs. George Sperling (1960) was credited for conducting classic experiments on sensory memory.

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## 7.4 MODELS OF MEMORY

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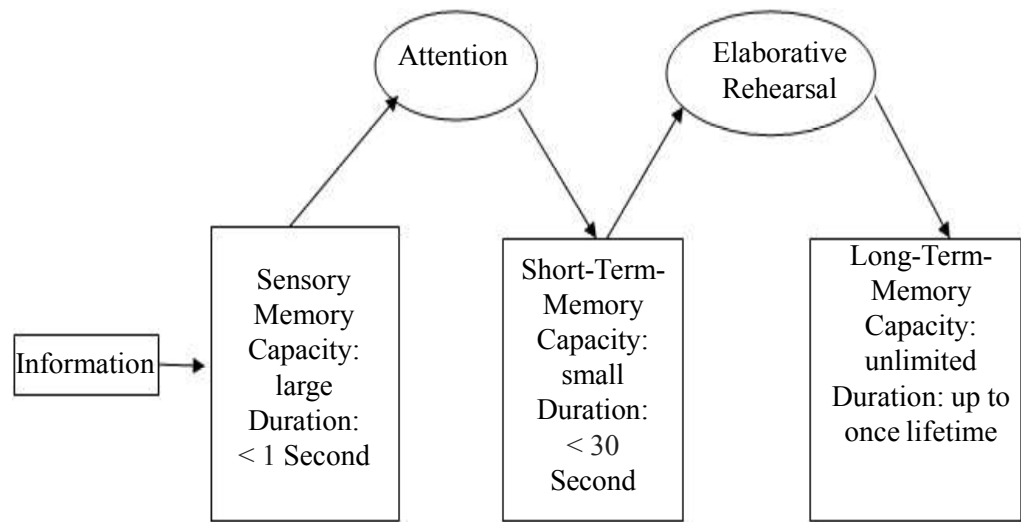
One can find several models of memory in literature. However, the following are the three most famous models to explain the process of memory that we are going to discuss:

### 7.4.1 The Traditional Model of Memory

Atkinson and Shiffrin (1968) proposed a model for memory, known as “Stage model of memory” or “Modal model”. This model is greatly influenced by the working of the computer. If you ever had use computers, you must be aware of two types of memory used by it; RAM (Random Accesses Memory) and ROM (Read Only Memory) or memory available in the computer in the form of hard drive. RAM is the memory that you use while performing a task at hand whereas ROM is that part of memory where you can save all types of files as it has a vast storage capacity.

Atkinson and Shiffrin (1968) equated working of human memory to the working of computers. They proposed that similar to computers, we also possess different forms of memory systems, described as follows:

- a) *Sensory memory*: In this, representation of sensory information is stored from a very brief period of time.
- b) *STM (Short Term Memory)*: This system also holds information for a short duration of time. Studies have suggested that it can hold information for up to 30 seconds. Tasks such as dialling a phone number manually or writing in a dictation.
- c) *LTM (Long Term Memory)*: It has been considered as a storehouse of all kinds of memories. You can remember things from last evening to since your childhood due to this system of memory.



**Fig.7.3: Atkinson and Shiffrin (1968) model of memory**

How does information move from one memory system to another? According to Atkinson and Shiffrin, only that information which can grab our attention will move from sensory memory to STM. Whereas, information from STM can only be moved to LTM through *elaborative rehearsal*-thinking in terms of the meaning of the information and relating it to already existing information in LTM.

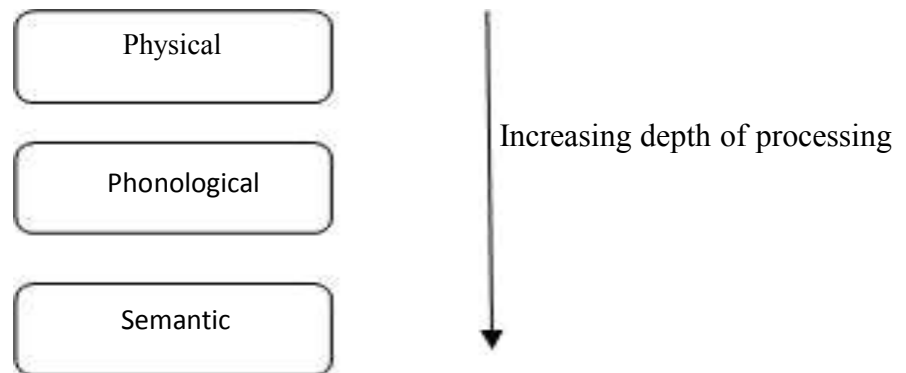
### 7.4.2 The Levels-of-Processing Model

This model refutes the claim of the Atkinson and Shiffrin model that memory consists of the different subsystem. According to the model of the levels of processing (LOP), whether the information will be retrieved successfully or not depends on its level of processing. LOP refers to the level at which information has been encoded.

Craik and Tulving (1975) have proposed three LOP:

- a) Physical/Structural Processing: Encoding of information based on its physical attributes.
- b) Phonological Processing: Encoding based on how it sounds. Such as, ‘Hat’ rhymes with ‘Cat’
- c) Semantic Processing: Encoding done based on its meaning and/or concept.

Studies on this model have suggested that deeper the level of processing, the higher will be its probability to be retrieved successfully.



**Fig. 7.4:Level of Processing (Craik & Tulving, 1975)**

### 7.4.3 An Integrative Model: Working Memory

The concept of STM propounded by Atkinson and Shiffrin was very narrow. They considered STM only as a short-term memory storehouse but later studies disapproved it. Later studies suggested that STM is dynamic in nature i.e., it works not just as a storehouse of information but also responsible for manipulation of incoming information for the completion of a cognitive task. In 1974, Baddeley & Hitch, after incorporating the idea of the level of processing (LOP) proposed a new model for STM and termed it as working memory. Thus, working memory can be defined as “a limited-capacity system for temporary storage and manipulation of information for complex tasks such as comprehension, learning, and reasoning” (Goldstein book, pp. 131).

Baddeley’s model of Working Memory (WM) consists of four components: the *central executive*, the *phonological loop*, the *visuospatial sketchpad*, and the *episodic buffer* (Figure 5).

- The **central executive**, as the name suggests it works as an executive in our working memory. It coordinates and regulates cognitive operation between sub-ordinate systems namely, phonological loop, visuospatial, and episodic buffer. It decides which of the memory will become part of long-term memory and which will fade away.
- The **phonological loop** is responsible for storing verbal and auditory information. The information stored in the phonological loop will decay within 2 seconds unless it is not rehearsed. It consists of two components: **phonological store**, which stores information for few seconds; and the **articulatory rehearsal process**, responsible for rehearsing the information in order to keep the information stored in phonological store from decaying. For instance, trying to remember a phone number, you have been just told by your friend, involves the phonological loop.
- The **visuospatial sketchpad** keeps visual and spatial information stored. For instance, the mental picture that comes up in your mind while listening to a story or solving a puzzle involves using your visuospatial sketchpad.

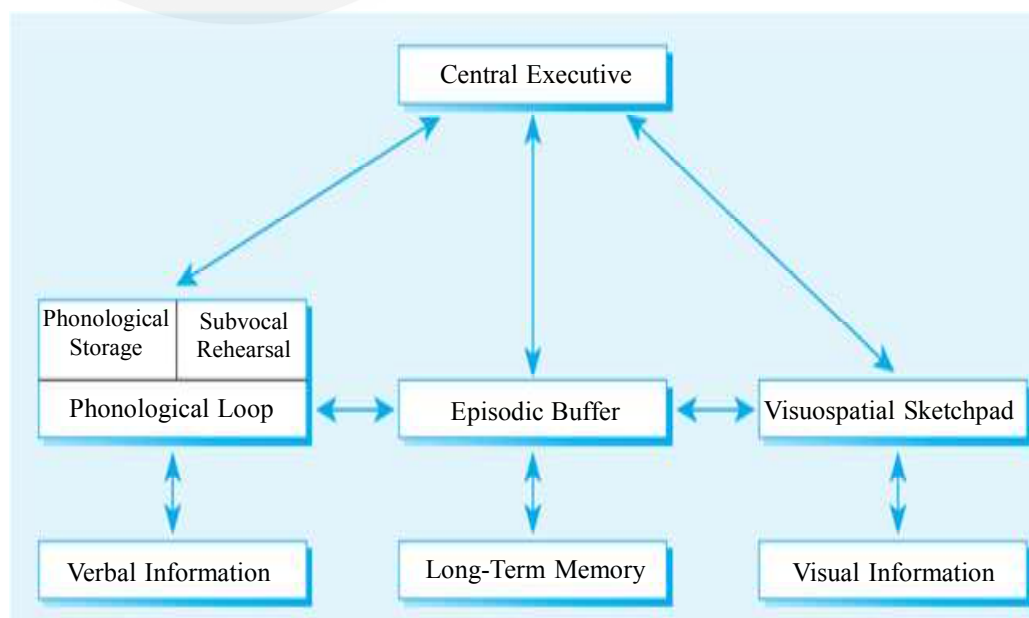


Fig.7.5: Baddeley’s Model of Working Memory

Source: Sternberg (2012, pp. 204)

- The **episodic buffer** is responsible for combining information from the phonological loop, visuospatial, and long-term memory for generating a unitary episodic representation of information. Thus, this component helps us in making a sense of the received information.

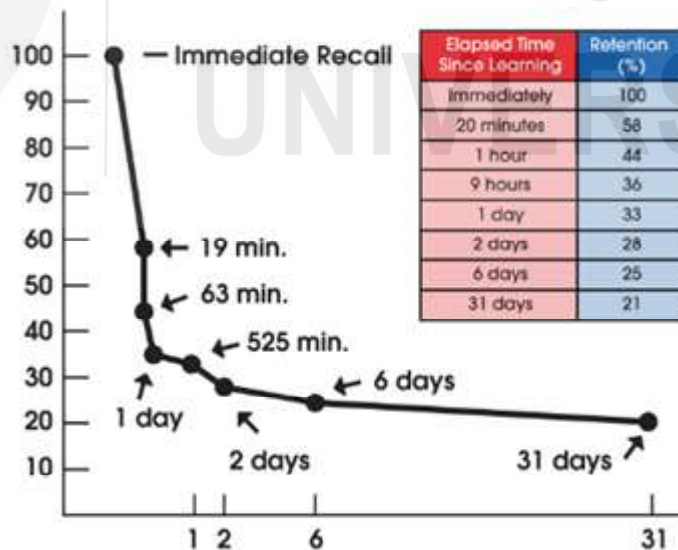
**Self Assessment Questions (SAQ I)**

State whether the following are ‘True’ or ‘False’:

- 1) LTM (Long Term Memory) is considered as a storehouse of all kinds of memories. ....
- 2) The visuo spatial sketchpad is responsible for combining information from the phonological loop, visuospatial, and long-term memory for generating a unitary episodic representation of information. ....
- 3) Short term memory is also known as ‘fleeting memory’. ....
- 4) Encoding is the process of converting sensory information into a form that can be processed further by the memory systems. ....
- 5) The memory associated with our experiences or life events is called as episodic memory. ....

**7.5 CONCEPT AND THEORIES OF FORGETTING**

Why do we tend to forget the names of the people we just met? Or why do we forget the phone number we just dialled a few minutes ago? We all have experienced forgetting in their day to day life, but what are the causes behind it? According to psychologists, forgetting is our inability to recall already encoded and stored information from our memory system.



**Fig. 7.6: Ebbinghaus Forgetting Curve**

Source: <http://www.keyandparent.com>

To understand the nature of forgetting, Hermann Ebbinghaus, a German psychologist, conducted the first systematic experiment in 1879. He created many CVC (constant vowel constant) nonsense syllabuses such as NAK or PUD and administered on himself. The method of conducting an experiment on oneself only and using your own experience is known as *the introspective method*. To



investigate the nature of memory and forgetting, first, he memorised lists of nonsense syllabus until he had reached pre-defined criteria and then measured the number of syllabi retained by him after a variable time interval. Further, he also noted the number of trials taken by him to relearn the same list of syllabus again at a variable time interval. Based on his observations, he came up with the following curve for explaining the nature of forgetting;

This curve is known as Ebbinghaus forgetting curve. You can see from the graph that the rate of forgetting is the maximum in the starting but after a few hours, it becomes slow. Recent studies have reported similar results.

There are basically following two classes of theories available in the literature explaining the causes of forgetting:

### 7.5.1 Theory of Interference

According to this theory, forgetting occurs due to interference with other memories. This interference can be of two types:

*Proactive Interference* (Pro=forward) - Forgetting of newly acquired information due to interference from previously learned information.

*Retroactive Interference* (Retro=backward) - Forgetting of previously stored information due to the learning of new information.

- **Trace Decay Theory**

Also known as disuse theory, trace decay theory proposes that learning causes change in the central nervous system leading to the formation of *memory traces*-physical change in the brain due to learning. When these memory traces are not used for a long time, they fade away leading to forgetting. Thus, the underlining mechanism of this theory is “use it or lose it”, i.e., if you did not use your stored information at a regular interval of time then you may be at the risk of losing it.

- **Cue-Dependent Forgetting Theory**

According to this theory, forgetting can also occur due to the absence of an appropriate cue or presence of poor cue. Suppose you were given a list of objects to buy from the market. By mistake, you lost the list. Now, you are trying your best to recall all the items from the list, but there are good chances that you will forget many. Studies have suggested that if subjects were given a hint or clue about the category of those items, then it improved their recall. Studies have even suggested that the physical attributes of the environment also play positive role retrieval.

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## 7.6 STRATEGIES FOR ENHANCING MEMORY

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India's Shakuntala Devi, a child prodigy, had many world records on her name. She was a part of many psychological studies because of her incomparable abilities to solve mathematical problems within a few seconds. In 1977, at Southern Methodist University, she calculated the 23<sup>rd</sup> root of a 201-digit number in just 50 seconds. Interestingly, to verify her answer, a special computer program was written by US Bureau of Standards to perform such a difficult calculation (Jensen, 1990).



**Fig.7.7: Google doodle honouring Shakuntala Devi: The human calculator on her 84<sup>th</sup> birthday.**

**Source:** <https://www.google.com>

All of us desire to have a memory like her but most of us suffer from some kind of memory failure. Having ability like Shakuntala Devi is very rare but we can definitely help you in improving your chances to memorise information effectively. In this section, we will discuss **mnemonics** (pronounced as ni-mo-nicks) - methods or techniques of enhancing memory. There are basically two broad categories of mnemonics; one category of mnemonics use images, while other uses principles of organization to memorise information.

### 7.6.1 Mnemonics Using Images

There are many strategies which use images to improve efficiency in retaining and retrieval of information. Following two types of mnemonics use images:

1) *Method of Loci: placing images at the location*

Loci (pronounced as low-sye), is the plural form of “Locus”, which refers to position or place. This method uses the location of a familiar place as a cue to retrieve information. Now suppose, you want to learn a list of objects that you want to buy from a nearby grocery store. The lists contain items like egg, tomato, pen, washing powder and salt. Now to remember these items, first, visualise each of them to be located in some separate spatial location, such as, in different rooms of your house. Then, mentally go through your house visualising each item in a separate place. After reaching the market, all you need to do is to take another mental tour of your house and recall the items you have placed in the different location in a sequence.

2) *Keyword method*

The keyword method is considered appropriate for learning vocabulary and foreign language. In this method, any two pieces of information are linked using images. Now suppose, you want to extend your vocabulary for the English language. You come across a word “scowl” which stands for “an angry or bad-tempered expression”. In order to learn its meaning first, you need to find a *keyword*- a familiar word that sounds similar to the *target word*- scowl. Now, using an image try to relate your target word to the keyword. Since the word ‘scowl’



**Fig.7.8:An owl with an angry expression**

**Source:** <https://pixabay.com>

sounds similar to owl; you can imagine a picture of an owl with an angry expression. Studies have suggested that this method of learning definition or vocabulary is far more superior than rote learning.

## 7.6.2 Mnemonics Using Organisation

It improves the ability to learn and retrieve information accurately by applying the principle of reorganization of the material to be learned. Under this section, we will discuss two types of mnemonics:

- *Chunking*

It is a method of combining smaller units into meaningful larger units, such as, if you were asked to remember the following series of number :

1-9-3-9-1-9-4-5

If you are well versed with world history, then, you can also group these numbers in the following ways;

1939-1945

Second World War started in 1939 and ended in 1945. In this way, you can memorise as well as recall these numbers more accurately. You can also chunk information by using it in sentences, songs or phrases.

- *First Letter Technique*

In this technique, the first letter of each word, you want to memorise, is taken to make a meaningful word or sentence. For example, the colour of the rainbow can be remembered using this technique.

Violet

Indigo

Blue

Green

Yellow

Orange

Red

The word VIBGYOR stands for all the seven colours of the rainbow.

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## 7.7 APPLICATIONS OF MEMORY IN EVERYDAY LIFE

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Till now we have discussed different models of memory, its characteristics, and reasons for forgetting information and methods to improve our memory. Now let us see, how psychologists have discussed our memory in the day to day life. We will discuss three topics to understand the role of memory in our daily routine: autobiographical memory, false memory, and flashbulb memory.

### 7.7.1 Autobiographical Memory: What has Happened in My Life

As the name suggests itself, it is the memory of your own past events or personal experiences. Our autobiographical memory (AM) is generally accurate but sometimes it is also influenced the constructive nature of memory. But, do we remember life events from all periods of life equally? Studies have suggested that people from middle age remember life events from their youth period and early-adult period more vividly than their recent past (Read & Connolly, 2007). Marigold Linton (1975, 1982) did a classic study on AM using Ebbinghaus method of introspection. She kept a diary for six periods, recording at least two events per day. She studied these recorded memories to understand the nature of AM.



**Fig.7.9: Our memories**

*Source:* <https://www.newscientist.com>

### 7.7.2 False Memory

As the name suggests, it is the memory of an event that never happened. It can be defined as “a mental experience that is mistakenly taken to be a veridical representation of an event from one’s personal past (International Encyclopedia of the Social & Behavioural Sciences, 2001). Also known as recovered memory or pseudo-memory, these memories are very vivid and emotionally charged. In a majority of the false memory cases, people were found to have a memory associated with the act of childhood sexual abuse or violence. Various studies have suggested that our memory is not fixed and it can be easily manipulated through effective suggestion, such as during a session of psychotherapy. False memory syndrome is very relevant in the context of psychotherapy and forensic witness. In a study, it was found that around 20% memory of the witnesses were false (Mazzoni, Scoboria, and Harvey, 2010).

### 7.7.3 Flashbulb Memory: Memories of Emotionally Charged Events

What were you doing, when you first heard about 9/11 attack? What was your first reaction? Many people still have very clear memories of the 9/11 attack. They could recall what they were doing when they first heard about it, from where they heard it, how they felt and other details vividly. So, what is so special about this memory? According to Roger Brown and James Kulik (1977), these memories are so vivid that it seems to be persevered as a film. In the context of



**Fig. 7.10: 9/11 terrorist attack on world trade towers, USA**

Source: <https://www.onthisday.com>

What are the reasons for such vivid memories of an event? Studies have pointed out a number of factors like the emotional intensity of the event (Bohannon, 1988). Another view suggests that because of the significance we retell our experiences leading to frequent rehearsal and thus making those memories more accurate and vivid even after many years (Bohannon, 1988).

### Self Assessment Questions (SAQ-II)

Fill in the following blanks:

- 1) .....refers to forgetting of newly acquired information due to interference from previously learned information.
- 2) .....is also known as recovered memory or pseudo-memory.
- 3) .....is a method of combining smaller units into meaningful larger units.
- 4) The .....is considered appropriate for learning vocabulary and foreign language.
- 5) .....is the method or technique of enhancing memory.

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## 7.8 LET US SUM UP

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In this unit, we discussed the nature of memory. Now we know that memory refers to the ability to retain information and reproducing it over a period of time when required to perform a cognitive task. We discussed different types and different models of memory. Further, we discussed why we sometimes fail to retrieve the required information, leading to memory failure. A number of theories explaining the cause of forgetting were also discussed. Lastly, the role of memory in our daily life was discussed in this unit.

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## 7.9 UNIT END QUESTION

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- 1) Write a note on the nature and types of memory.

- 2) What is the difference between short-term memory and working memory?
- 3) Briefly explain the Baddeley's theory of working memory.
- 4) What is forgetting? Explain the theory of interference in the context of forgetting.
- 5) Differentiate between autobiographical memory and false memory.
- 6) Write any three techniques to improve memory.

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## 7.10 GLOSSARY

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<b>Memory</b>	: It refers to the ability to retain information and reproducing it over a period of time when required to perform a cognitive task.
<b>Explicit memory</b>	: It refers to that memory system which can be controlled consciously and for which we are aware of in some form.
<b>Implicit memory</b>	: The system of memory for which we pose no awareness. It works unconsciously and without any efforts and intentions.
<b>Forgetting</b>	: It is our inability to recall already encoded and stored information from our memory system.
<b>Method of Loci</b>	: It is a method of enhancing memory. It uses the location of a familiar place as a cue to retrieve information.
<b>Chunking</b>	: It is another memory of remembering and recalling information correctly. In this method, smaller units of information are combined into meaningful larger units.
<b>Autobiographical memory:</b>	It is the memory of your own past events or personal experiences

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## 7.11 ANSWERS TO SELF ASSESSMENT QUESTIONS (SAQ II)

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### SAQ-I

- 1) True
- 2) False
- 3) False
- 4) True
- 5) True

**SAQ-II**

- 1) Proactive Interference
- 2) False memory
- 3) Chunking
- 4) keyword method
- 5) Mnemonics

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