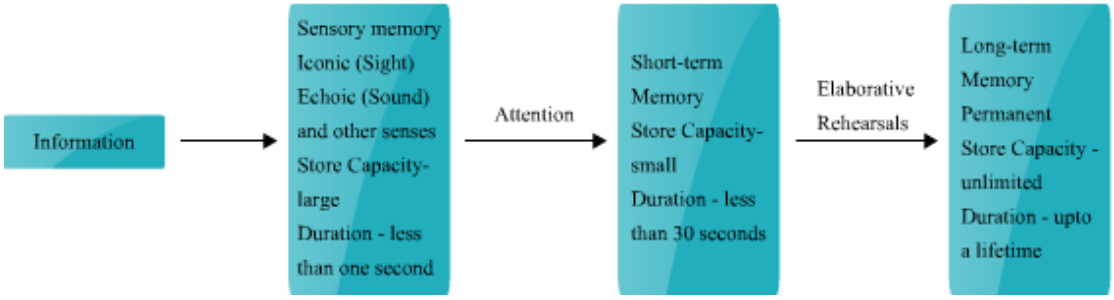
Chapter 7

Human Memory

❖ **Memory-Nature**

- It implies retaining and recalling any information over a given period of time.
- Memory consists of three independent, but interrelated stages:
  - i. **Encoding:** It is the process by which information is recorded and registered for the first time in order to be used by our memory systems. In encoding, the information is received and a meaning is derived. Then it is represented in a way to be processed further.
  - ii. **Storage:** The encoded information is stored to be used later. Hence, it is the process through which the information is retained.
  - iii. **Retrieval:** It is the third stage whereby the information can be used only when it is recovered from the memory. It is the bringing of stored information into awareness in order to be able to perform the cognitive tasks.
- **Processing Information–Stage Model**The information through sensory, short-term and long-term memory systems are processed in the following ways:
  - i. **Sensory Memory:** It has a large capacity where the incoming information first enters. This information is of very short duration, for less than a second. This memory system registers the information from each of the senses with a reasonable accuracy.
  - ii. **Short-term Memory:** It refers to the system which holds small amount of information for a brief period of time. According to Atkinson and Shiffrin, the information here is primarily encoded acoustically, i.e. in terms of sound and unless it is rehearsed continuously, the information gets lost within 30 seconds.
  - iii. **Long-term Memory:** The information which survives in short term memory enters the long term memory system. The information entered here is never forgotten as it gets encoded semantically. Thus, it is a permanent storehouse of

all the information. Its various types are – Declarative and Procedural, Episodic and Semantic.



- The short term memory system uses maintenance rehearsal to retain the information for a longer duration and is carried through silent or vocal repetition.

- Elaborative rehearsals on the other hand connect the 'to be retained information' with the already existing information in long-term memory. The number of associations that is created around the new information determines its permanence.

❖ **The Hierarchy of Memory**

- The hierarchical organisation in a long term memory was suggested by Allan Collins and Roses Quillian.
- They observed that the knowledge in long-term memory is organised hierarchically.
- The elements of this structure are called nodes. Nodes refer to the concepts and the connections between nodes are called labelled relationships that indicate category membership or concept attributes.
- According to this view, all the knowledge can be stored at a certain level, which applies to all the members of a category without repeating that information at the lower levels in the hierarchy.

❖ **Memory as a constructive process**

- According to Bartlett, memory is an active process and all that is stored undergoes continuous change and modification.

- He pointed that the memorised information is influenced by the meaning that is assigned to the stimulus material. After it is committed to the memory system, it cannot remain in isolation from other cognitive processes. Therefore he opined that memory is a constructive process.

❖ **Forgetting**

- Forgetting takes place at a maximum rate during the first nine hours, after which this rate slows down and not much is forgotten even after many days.
- This experiment was conducted by Ebbinghaus who memorised the lists of nonsense syllables and then measured the number of trials to learn the same lists after different time intervals. There have been different theories related to explain the cause of forgetting. These are:
  i. Forgetting due to trace
  ii. Forgetting due to interference
  iii. Forgetting due to retrieval failure

❖ **Concept**

- A concept refers to the category, which is used to refer to a number of objects and events.
- It can also be defined as a set of features connected by a rule.
- A feature refers to any characteristic of an object or event or living organism that is observed in them, and can be considered equivalent to some features observed or discriminated in other objects.
- A concept is of two types:
  i. Artificial concept
  ii. Natural concept

❖ **Mnemonics to Enhance Memory**

- Mnemonics are strategies to enhance memory by using images or emphasising the organisation of the learnt behaviour.

- Keyword method and method of loci are two prominent mnemonic devices based upon images.
- Chunking and first-letter technique are mnemonics based upon organisation of the information to be learnt.
- Deep level processing, minimising interference and presence of adequate retrieval cues are helpful in memorising.

❖ **Important Terms and Definitions**

- **Chunking:** A group of familiar stimuli stored as a single unit. It helps the increase the capacity of Short Term Memory.
- **Cognitive economy:** It refers to a maximum and efficient use of the long-term memory through organisation of concepts in a hierarchical network.
- **Control process:** It is a process that monitors the information through various memory stores.
- **Dual coding:** Theory by Paivio, suggesting that knowledge related to all concrete objects generates images, which is encoded both verbally and visually.
- **Echoic memory:** It is a component of short term memory that retains auditory information.
- **Episodic memory:** LTM component that stores biographical information, or personal life information, which is coded for reference to a time frame for past occurrences.
- **Elaborative rehearsals:** It links the present stored information to the new information that would be stored.
- **Fugue state:** A disorder of highly generalised amnesia accompanied by actual physical flight.
- **Information processing approach:** An approach concerned with the processing of information by the individuals, the entrance of information in the

mind, the storage and transformation and the received information to perform problem solving and reasoning.

- **Maintenance rehearsals:** Process to maintain the information for long duration to enhance subsequent access to it.
- **Schema:** A cognitive structure of mental frameworks to organise and guide the individual's perception.
- **Semantic memory:** LTM component that stores memory for general awareness, knowledge with basic meanings of words and concepts.
- **Working memory:** Memory processes that preserve recently perceived events or experiences. It requires a goal oriented monitoring, or manipulation of information.