



Memory

Basic Cognitive processes

Memory

- Learning - the focus is acquisition process.
- Memory - the focus is retention process.
- Human Memory is a system for storing and retrieving information which is acquired through our senses.
- It consists not of one but of many systems which range in
 - a) Storage duration from fractions of a second up to a lifetime and in
 - b) Storage capacity from tiny buffer stores to the long-term memory system.

Memory

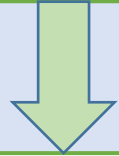
- Memory is our cognitive systems for storing and retrieving information.
- We can form memories of information, events, emotions, & sensations.
- It is not a perfect system.

Outline

| Three Stages of Memory | Three Memory Stores | Different Memories for different Information |
|---|--|---|
| <ol style="list-style-type: none">1. Encoding2. Storage3. Retrieval | <ol style="list-style-type: none">1. Sensory Memory2. Short-term Memory3. Long-term Memory | <ol style="list-style-type: none">1. Implicit Memory2. Explicit memory |

Stages of Memory

Encoding: The process through which information is converted into a form that can be entered into memory.



Storage: The process through which information is retained in memory.



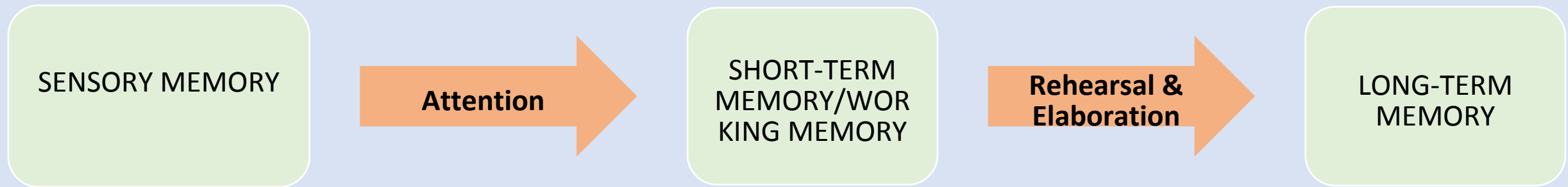
Retrieval: The process through which information stored in memory is located.

Stages of Memory

- Theories of memory attribute forgetting to a failure at one or more of these stages.



Stages of Memory



Memory Stores

1. Sensory Memory

- The brief storage (in memory) of information experienced by the senses; typically only lasts up to a few seconds.
- Sensory memory allows individuals to recall great detail about a complex stimulus immediately following its presentation.
- No manipulation of the incoming information occurs.

Types of Sensory memory

1. *Iconic Memory* – also known as visual memory and has a duration of about 100 ms.
2. *Echoic Memory* – related to the auditory system, capable of holding a large amount of information but only for 3-4 seconds.

Memory Stores

2. Short-term Memory (STM)/Working Memory

- Short term memory is primary or active memory that is capable of holding small amount of information for a brief period of time.

Duration – 30 seconds to 1 minute

Capacity – 7 ± 2 (Magic Number)

- It is semantic in nature.

Memory Stores (STM)

Encoding

Phonological Coding – Sounds or name of the digits

Visual Coding – mental representation in form of pictures

Phonological Loop – storing and operating for information in acoustic codes

Visual-spatial Sketchpad – holds and operates upon visual or spatial information.

Storage

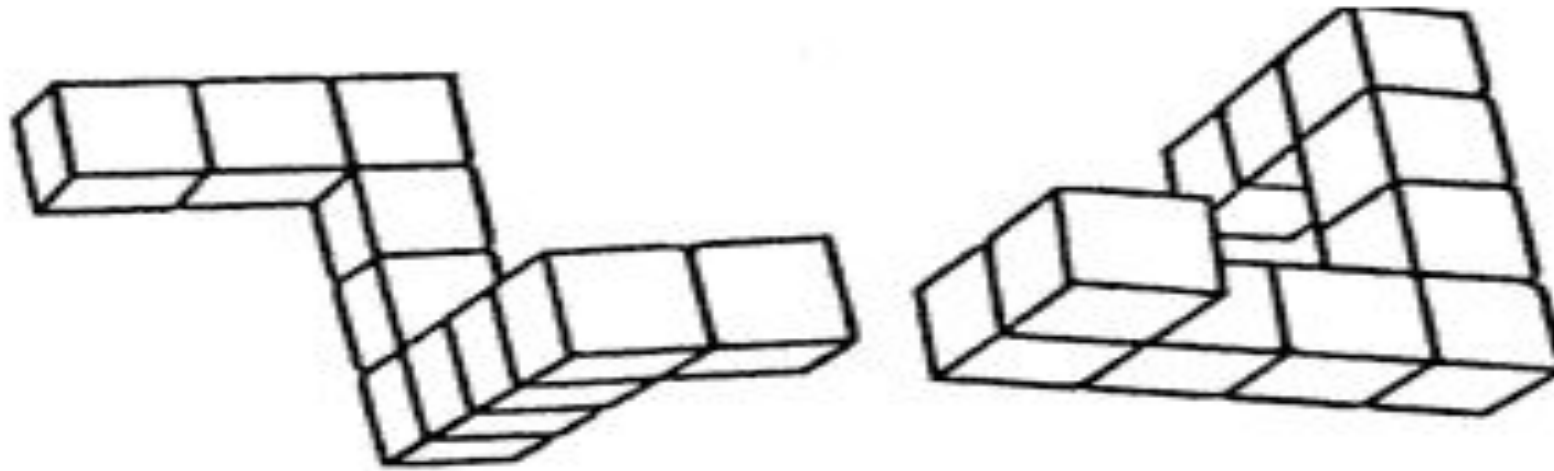
Improving STM

- Chunking
- Maintenance Rehearsal

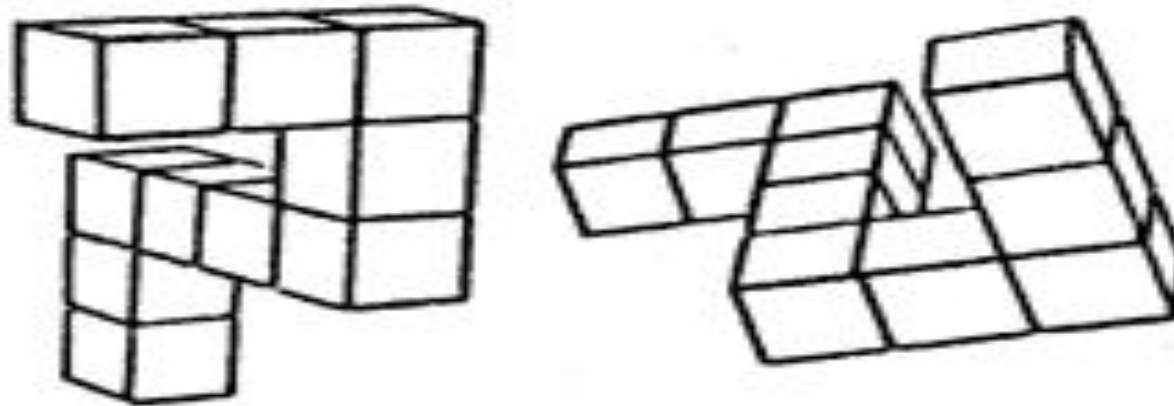
Retrieval

More the number of items slower is the retrieval

(a)



(b)



Mental Rotation Test—Are these two figures the same except for their orientation?

Serial Position Curve

- The **serial position effect** refers to our tendency to be able to recall the first and last items on a list better and the middle items worse.



- Primacy Effect – recall of the first few words presented in the list. (LTM)
- Recency Effect – recall of the last few words presented in the list. (STM)
- Proof that two different stores for memory exist.

Memory Stores

3. Long-term Memory (LTM)

- Long-term memory refers to the storage of information over an extended period.
- Duration – few second or lifetime
- Capacity – unlimited, but the major constrain is recall

Memory Stores (LTM)

Encoding

Encoding meaning

Adding meaningful connections

Storage

Elaborate rehearsal

Retrieval

Retrieval failure rather than the storage failure

Memory Stores (LTM)

Interaction between encoding and retrieval

Organization

Context

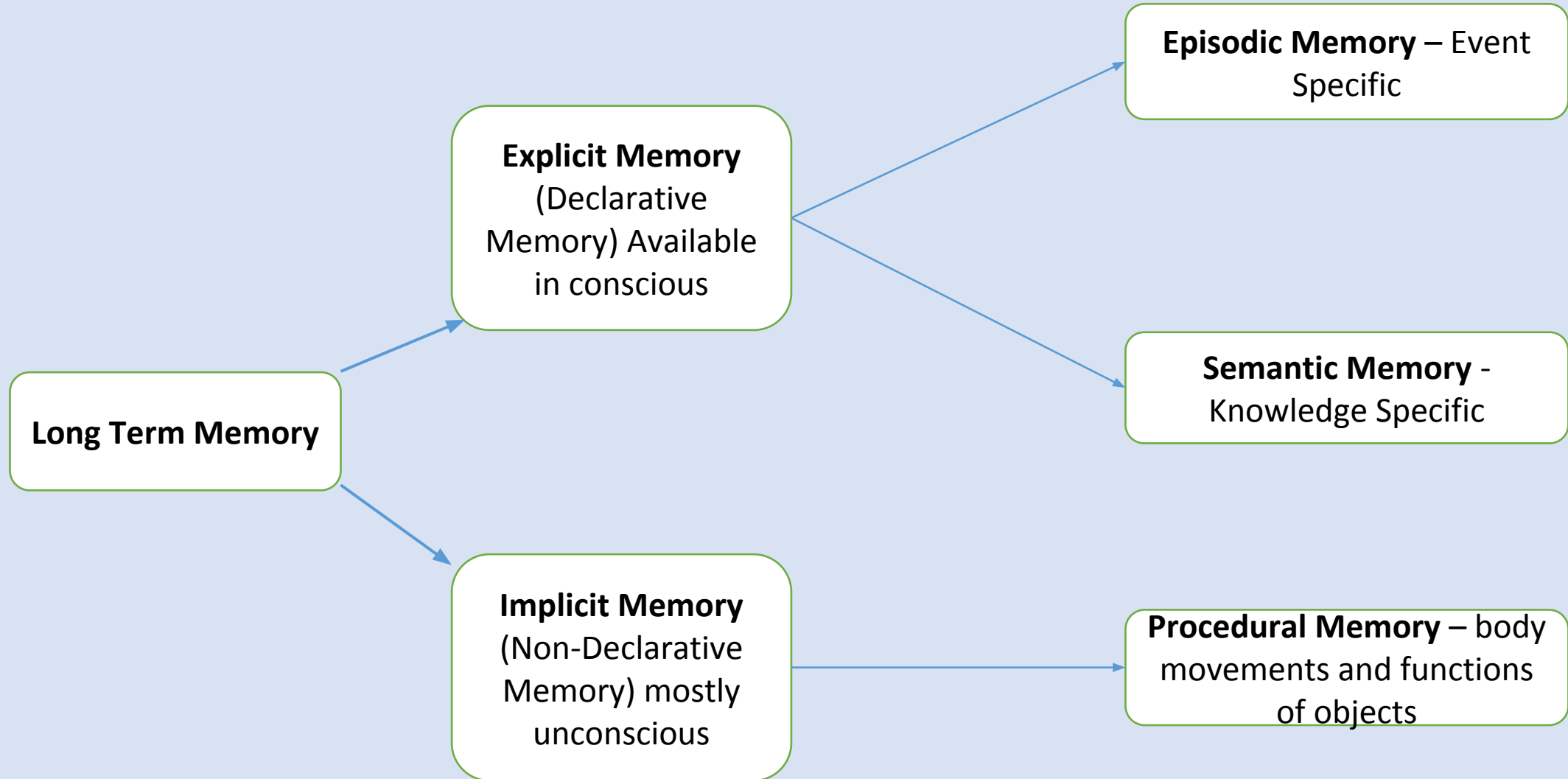
Emotional factors in forgetting

Rehearsal

Flashbulb memories - *remember learning about the event after it happened, memories of learning something so shocking or surprising that it creates a strong and seemingly very accurate memory of learning about the event--but not the event itself.*

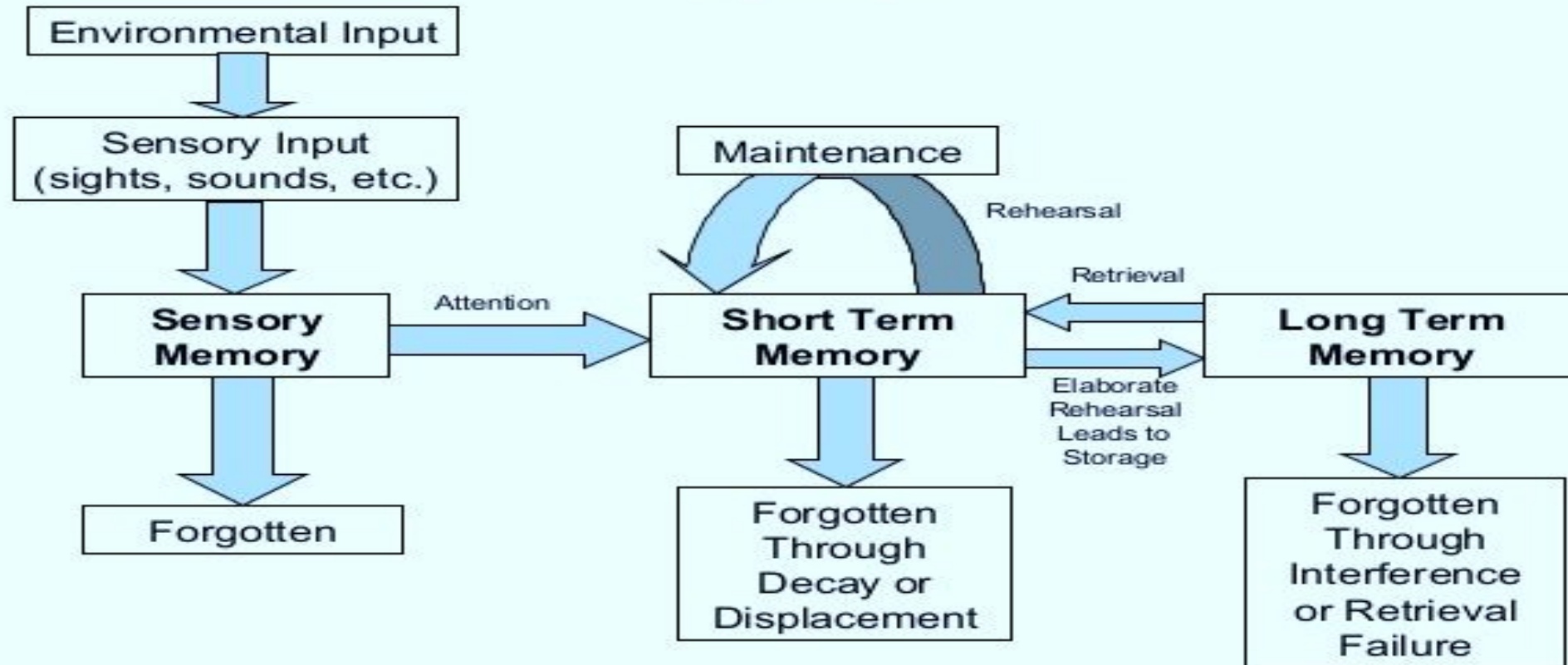
Context effect

Memories for Different Information

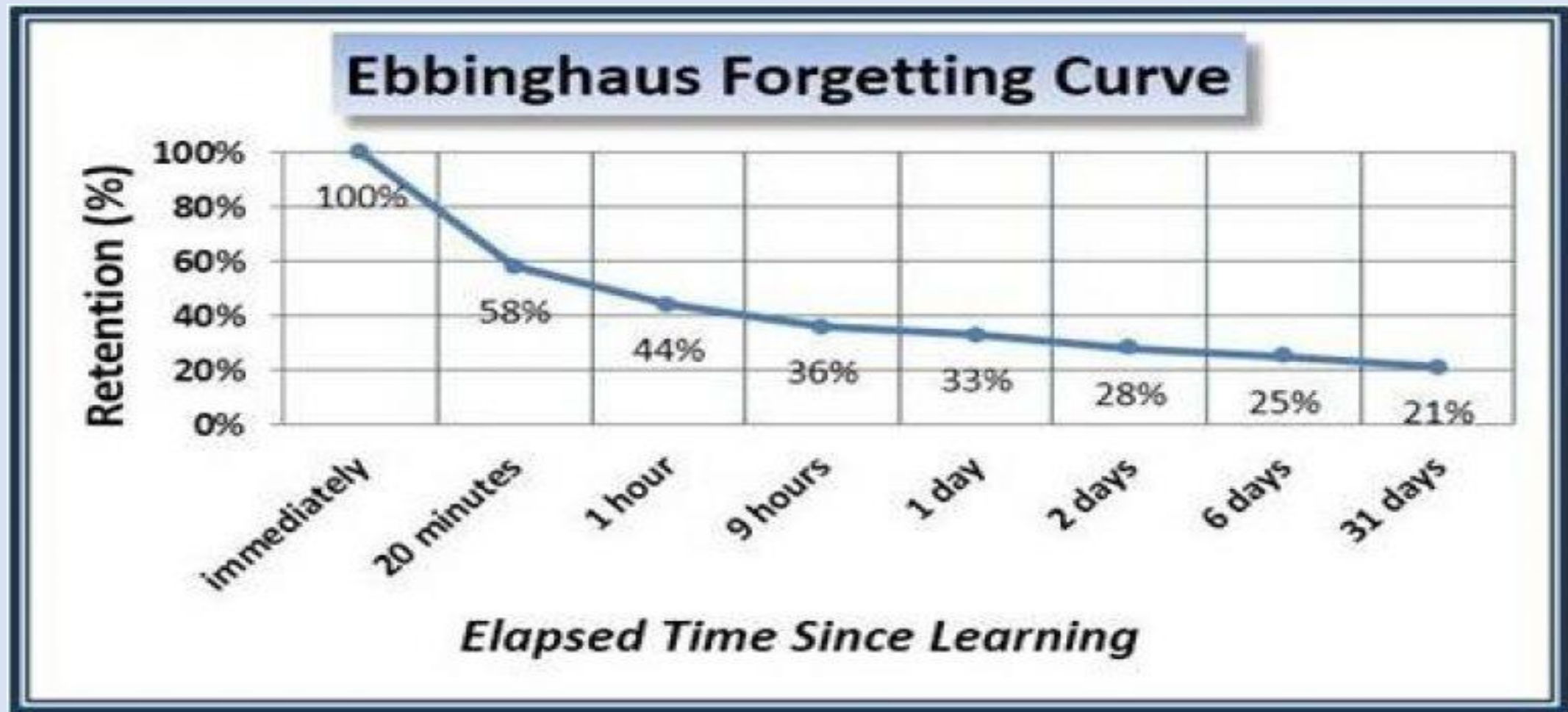


Atkinson-Shiffrin Model

Multi Store Model - Atkinson & Shiffrin



Forgetting



Improving Memory

- Chunking
- Imagery and encoding
- Elaboration and encoding
- Context and retrieval
- Organization
- Practicing retrieval

Constructive Nature of Memory

- Schemas – Memory
- Stereotypes – Memory
- Autobiographic Memories

Distortions in Memory

- Distortions in Memory because of the constructive nature of Memory
- Eye-witness Testimony

Schematic Memory

- Human Memory is largely reconstructive
- Schema organize information in memory and largely affect what we remember and what we forget
- People remember facts that are consistent with their schema
- Recall of three types of information-schema consistent, schema contradictory and material irrelevant to schema