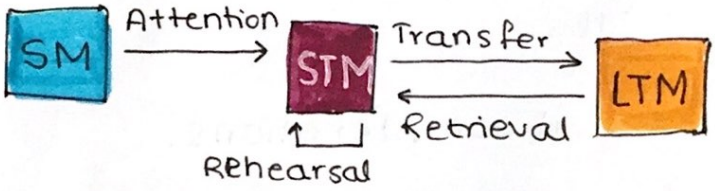
# COGNITIVE APPROACH TO BEHAVIOUR

## MODELS OF MEMORY

### The multi-store model

- proposed by Atkinson and Shiffrin
- memory consits of 3 components -

→ Sensory memory
→ short-term memory
→ long-term memory




**Memory** - cognitive process used to encode, store and retrieve information.

1. Sensory memory store:

- does not process information
- detects and holds the information
- several sub-components
- main → iconic memory (visual inputs)
  → echoic memory (auditory inputs)

- 2-5 seconds

The information transfers from the sensory to the short-term memory only if we pay attention.

2. Short-term memory store:

- capacity - 7 ± 2 chunks.
- 30 seconds
- it is easier to remember information by chunking.

Information can be transferred to the long term memory if we rehearse it.

3. Long-term memory store:

- can store large amounts of information.
- unlimited capacity
- information is easy to retrieve

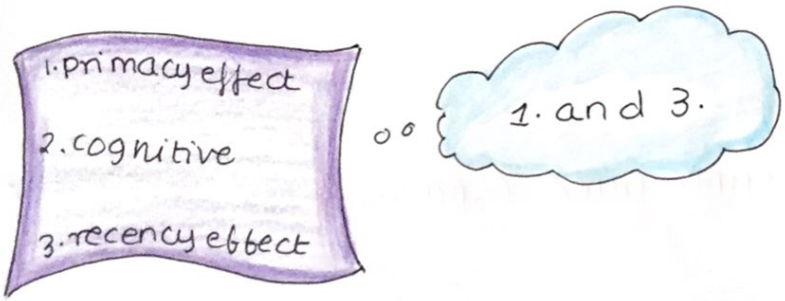
Researches supporting multi-store memory model

- Sperling (1960)
- Glanzer and Cunitz (1966)

Serial position effect:

tendency to recall the first and last items on a list better than the middle one.

- primacy effect: remembering words at the start of the list.
- recency effect: remembering words at the end of the list.




Levels of processing: model of memory

- by Craick and Lockhart (1972)
- recall is a function of depth of processing
- shallow and deep processing
- the deeper the information processed, the stronger its trace in the long-term memory.

1. Shallow processing:

- Superficial features of the stimulus
- structural processing (physical properties)
- phonetic processing (acoustic properties)

2. Deep processing:

- semantic processing
↓
building the stimulus into the structure of meaningful connections (linking it to prior knowledge).

- Bidirectional flow of information between the memory stores

STM $\rightleftarrows$ LTM

Types of memory:

- episodic - memory of events
- procedural - how-to-memory
- semantic - general knowledge


Researches:

- Sperling (1960) ✓
- Glanzer and Cunitz (1966) (SAC format) ✓

Memory is a cognitive process used to encode, store and retrive information. The multi-store memory model says that the human memory consits of three separate components. Sensory memory is the first component and its function is to detect information. It has 2 subparts known as the iconic memory (visual) and echoic memory (auditory). The second component is the short-term memory store that can store information temporarily for about 15 - 30 seconds. The last component is the long-term memory store which can store large amounts of information for indefinite periods of time if rehearsed in the short-term memory. serial position effect is the tendency to recall the first and last items on a list and not the middle items.

Glanzer and Cutniz did a research on serial position effect to see if short-term memory and long-term memory are separate memory stores. The participants chosen were 240 army enlisted men who were required to memorize lists of words followed by a free-recall task where they were allowed to recall the words in any order. In the first condition, they were presented with recordings of 20-word lists with monosyllable nouns. After hearing the words they were immediately asked to do a free-recall task for 2 minutes. In the second condition, the participants were told to do a filler task (counting back from a number for 30 seconds) after seeing the list to prevent rehearsal.

The results showed that, in the first condition, participants were able to remember the words at the start (primacy effect) & at the end of the list (recency effect). This clearly

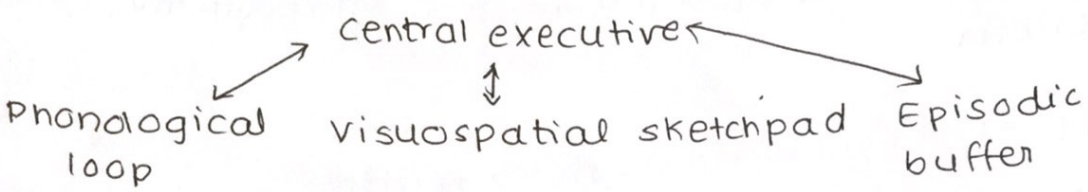
demonstrated the serial position effect. In the second condition, the 30 seconds distraction destroys the recency effect but not the primary effect. Without rehearsal, the last words are lost in the short term memory which results in the disappearance of the recency effect. Since one of the effects isn't seen and the other one is, it supports the idea that short-term memory and long term memory are 2 separate mechanisms.

The multi-store memory model has a few limitations as it focuses on the structure and doesn't focus on the process and is a linear model. It ignores the types of memory: episodic (memory of events), procedural (memory of basic tasks that aren't rehearsed on a daily basis). and semantic (general knowledge). Moreover, the short-term memory is oversimplified as there are more sub-components in the short-term memory (working memory model). Even though it has its limitations, it has some strengths as well. This model provides evidence for primary & recency effects. It is supported by the HM case study as well, where HM had problem in his long-term memory but his short-term memory remained intact. This model is a base for other findings and has generated many researches into memory.

## Working memory model:

- Baddley and Hitch (1974)
- focuses on the structure of short-term memory.

It consists of




### central executive

- co-ordinates the phonological loop and visuospatial sketchpad. (allocates information)

### Visuospatial sketchpad


- holds visual and spatial information.

### Phonological loop

- holds sound information
- sub divided into phonological store & articulatory channel.

### Episodic buffer

- integrates information from other components.
- links information to the long-term memory store.

Phonological loop

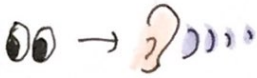
↙ phonological store (inner ear)

↘ articulatory rehearsal component (inner voice)

Inner ear


- holds the information in a passive manner

Inner voice



- turns visual stimuli into sounds
- allows the rehearsal of information stored in the inner ear.

## Support for working memory model.

Studies that have used dual-task technique support this model.

1. Conrad and Hull (1964) - phonological similarity effect.
2. Baddeley, Lewis and Vallar (1984) - articulatory suppression
3. Alan Baddeley (1996) - support for central executive

## Evaluation of working memory model:

- more sophisticated
- explains a wider range of phenomena
- physiological correlates to some of the separate components of the model.
- the working memory model doesn't overemphasize on the role of rehearsal.
- hard to test empircally
- only designed to test one specific aspect of the model.
- model is difficult to falsify
- only takes STM into account.