# HS 002: Introduction to Psychology

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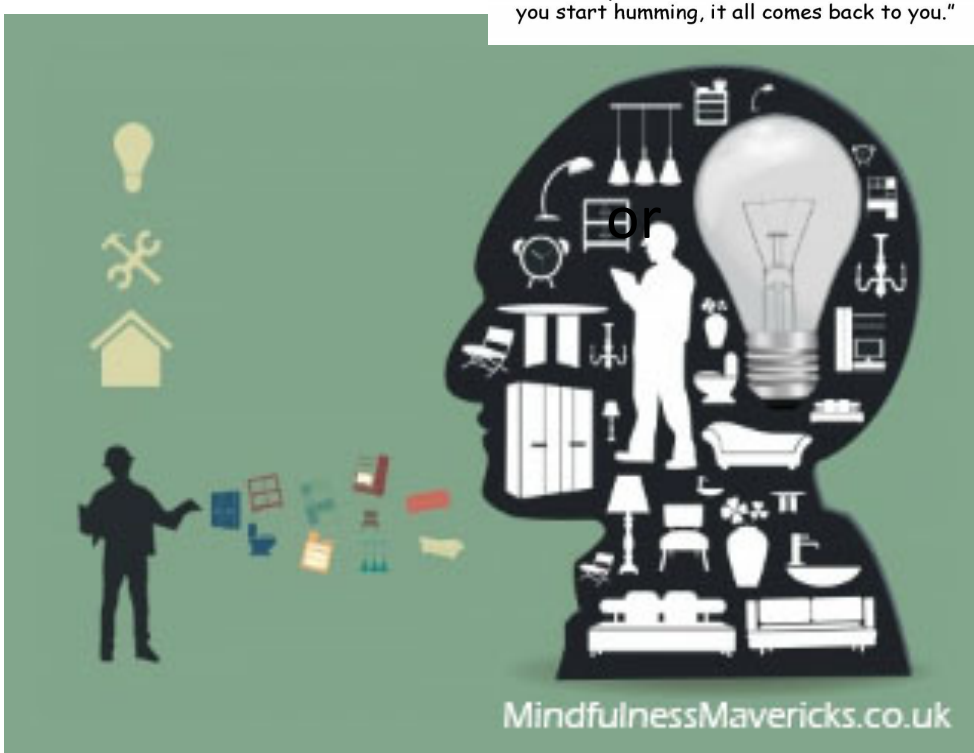
Lecture 11: 17.10.2019

# Information processing model

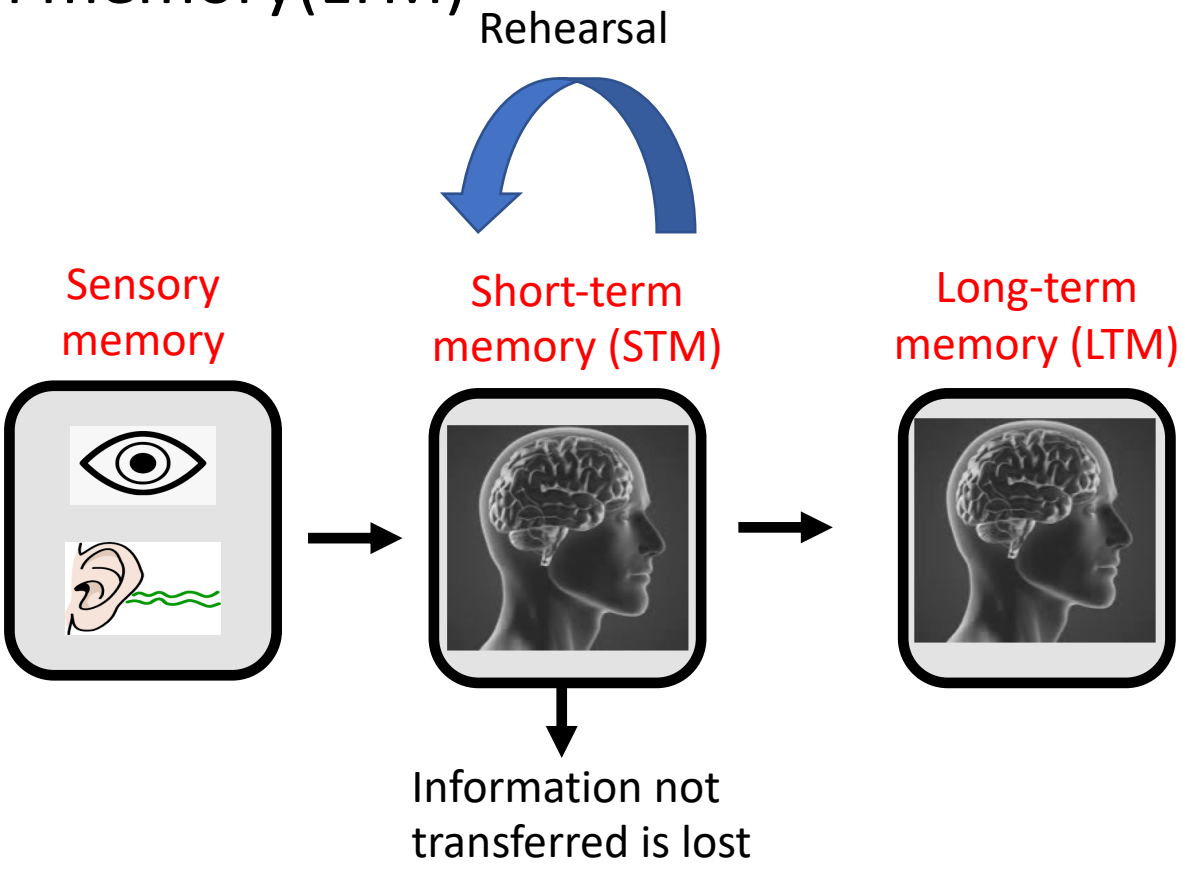
- Atkinson and Shiffren (1977) proposed the Information processing model

1. Encoding stage: sensory events are coded and changed to a format that makes additional processing model.
2. Storage stage: the incoming information is assigned a location and it usually remains there until it is either needed lost together.
3. Retrieval stage: In this stage previously stored material is reclaimed due to a present demand

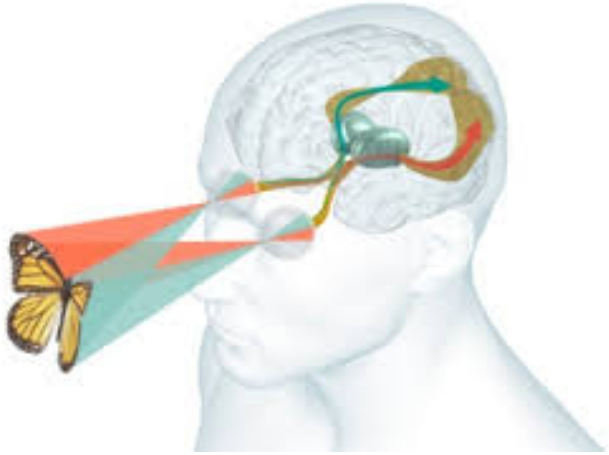
# Types of Memory

- Sensory memory (iconic & echoic memory)
- Short-term memory (STM)
- Long-term memory(LTM)




Atkinson-Shiffrin model of memory (1967)

# Sensory Memory



1. Sensory register
   - Preliminary bin, time to review novel information and to select key items to consider more extensively.

2. Iconic memory (visual sensory register: < 1sec)

- George sperling designed a letter matrix (3R x 4C) which was flashed for 50-msec (4-5 items were recalled).
- Partial report technique (PRT), one of three distinctively different tones signals subject to recall one of the 3-rows. PRT helps in enhancing the recall of information.

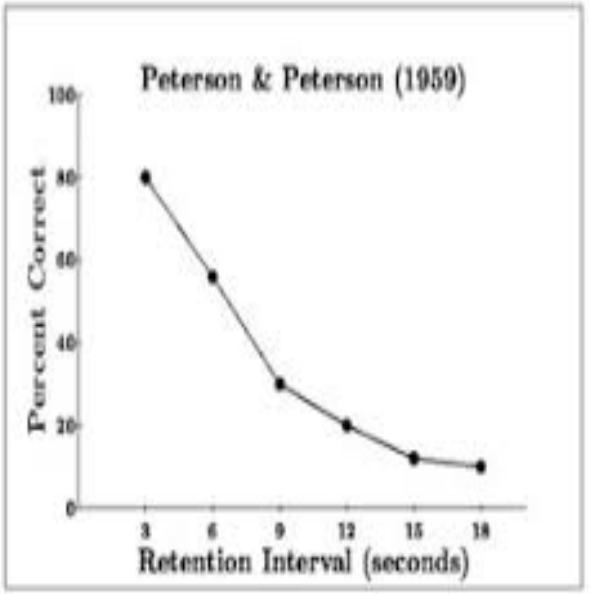
| | | | |
|---|---|---|---|
| B | C | L | N |
| F | J | V | K |
| G | A | S | M |

3. Echoic memory (auditory sensory register: <4sec)

If attention is elsewhere, sounds and words can still be recalled within 3-4sec. A simple test is when a person is asked to remember a series of numbers someone else was reciting immediately after the sequence was stopped.

# Short-term Memory (STM / Working memory)

1. **STM** is memory that holds information received from the sensory register for up to about 30seconds (when rehearsal or active maintenance is prevented)
2. **Rehearsal**: The process of rehearsal consists of keeping items of information in the center of attention, perhaps by repeating them silently or aloud. (e.g. following a road map, remembering a grocery list, etc.)
3. **Duration of STM**: Brown-Peterson paradigm (1958-59) rapid deterioration and loss of information housed in STM. Some information stored momentarily, perhaps not more than 20 sec.



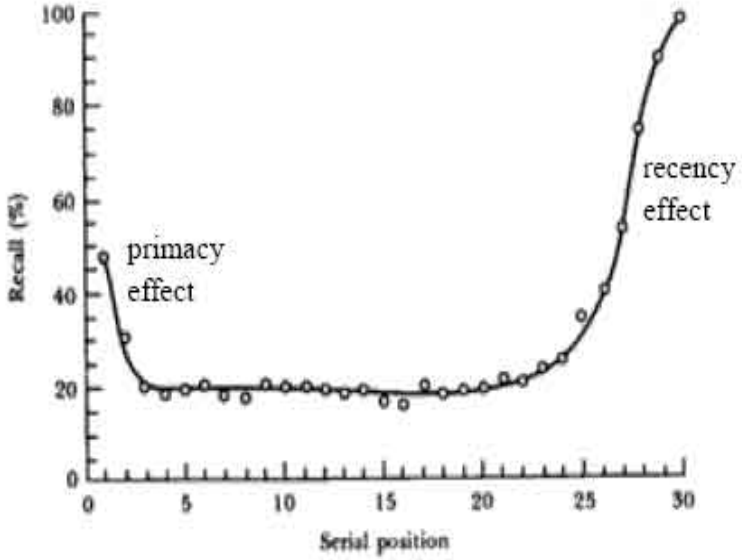
# Short-term Memory (STM)

1. **Capacity of STM:** Capacity of STM depends upon how information is encoded. When items are discriminated on the basis of how they sound (acoustical encoding), about 7-items can be accommodated at once (for e.g. telephone numbers, etc). 7-tems acoustically and 3-items non-acoustically.

Chunk of information: is a discrete coherent unit compiled from a smaller bits of data that share common properties and relationships. (eg. Academic concepts of science, etc.) TVFBIJFKY…. [(i) TVF..BIJF…KY…; (ii) TV…FBI…FKY…]

2. **Serial Position Phenomenon:** List of 15-nouns shown to participants, noun presented for 1-sec with 2-sec interval

1. **Primacy effect**: better recall at the beginning of the list
2. **Recency effect**: better recall at the end of the list

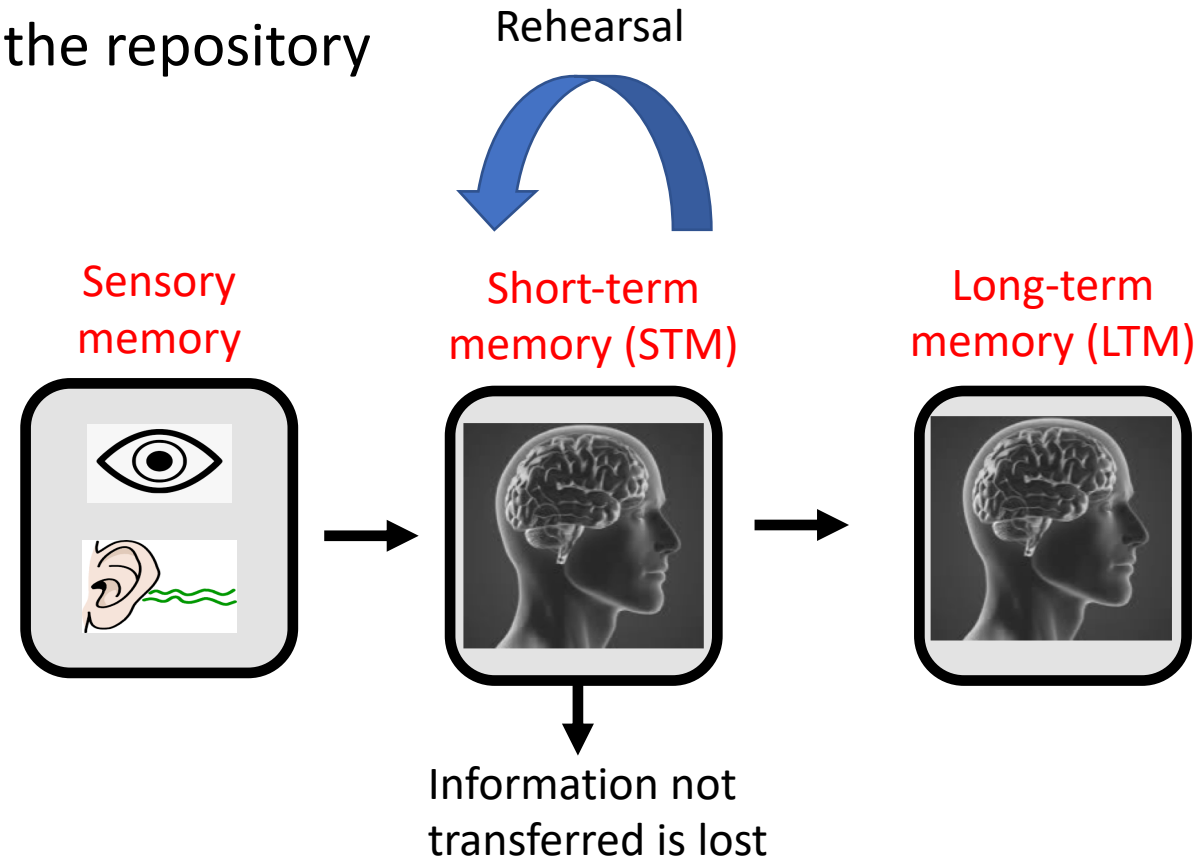



*Serial position curve*

# Long-term memory (LTM)

LTM is the final stage of the multi-store model proposed by Atkinson-Shiffrin (1968). It has two important features:

1. Lasting nature of the stored information
2. Great size of the repository



# Test

1. What is perception? (Row-1)
2. Explain laws of groupings? (Row1)
3. What is sensation and the process of sensation? (Row-2)
4. What is learning? (Row2)
5. Explain absolute and difference threshold? (Row-3)
6. Explain conditioning and its components?(Row3)
7. What is subliminal detection? (Row-4)
8. Explain operant conditioning and types of reinforcement? (Row4)
9. Explain gestalt principles of perceptual organization? (Row-5)
10. What is punishment and shaping? (Row5)

# THANKS!

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# HS 002: Introduction to Psychology

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# Memory

1. Memory is the cognitive system to acquire, store, retain, and later retrieve information

2. Memory is the process of maintaining information over time


3. Memory is involved in processing vast amounts of information. This information takes many different forms, e.g. images, sounds or meaning

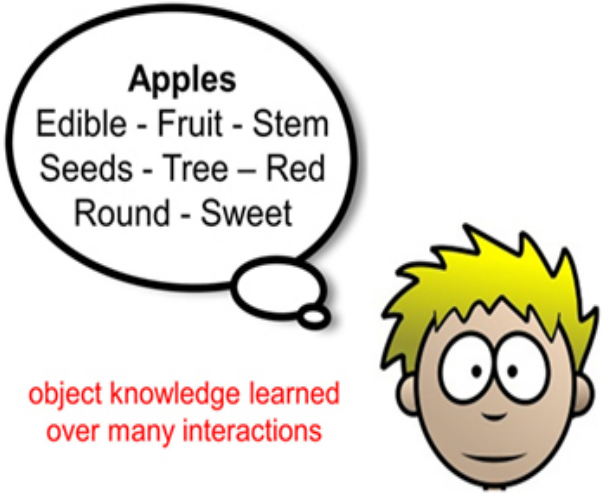
# Recap

1. Stages/Process of Memory
2. Types of Memory
3. Types of Sensory Memory
4. Rehearsal
5. Duration of STM
6. Capacity of STM
7. Chunking
8. Primacy
9. Recency

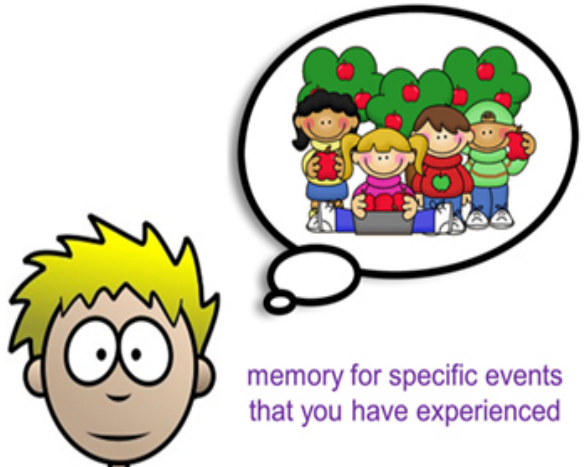
**Long-term Memory (LTM):** LTM holds a vast quantity of information which can be stored for a longer period of time. The information stored is diverse and wide-ranging and includes all of our personal memories, our general knowledge and our beliefs about the world.

## Two types of LTM system:

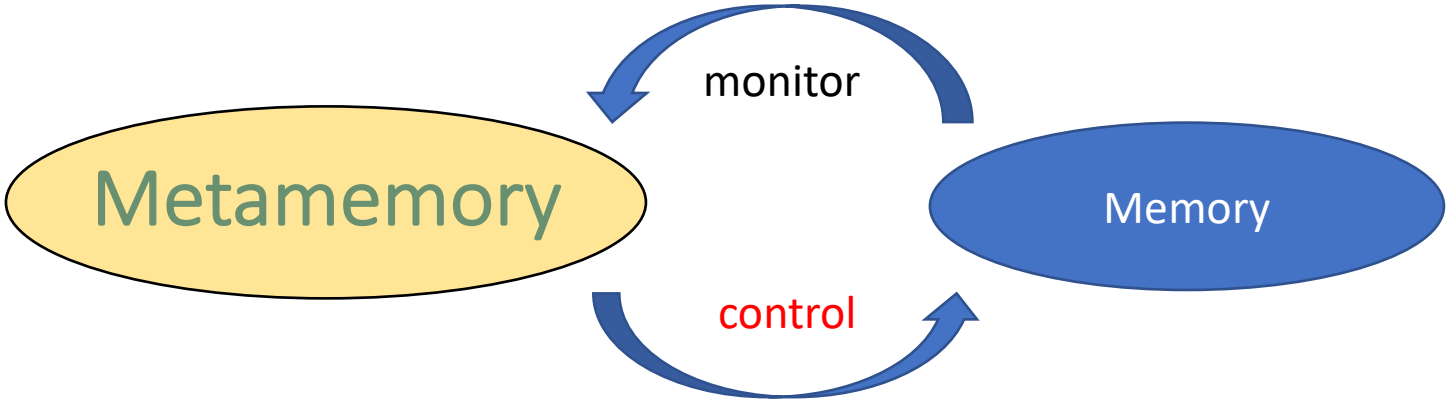
1. Semantic Memory: relates to the meanings of words and concepts and the rules for using them in language. It is a vast network of meaningfully organized items of information. (for e.g. formula for computing the area of circle)
2. Episodic Memory: relates to specific events in one's life and functions as a sort of autobiographical reserve. (for e.g. remembering the anniversary)




object knowledge learned over many interactions



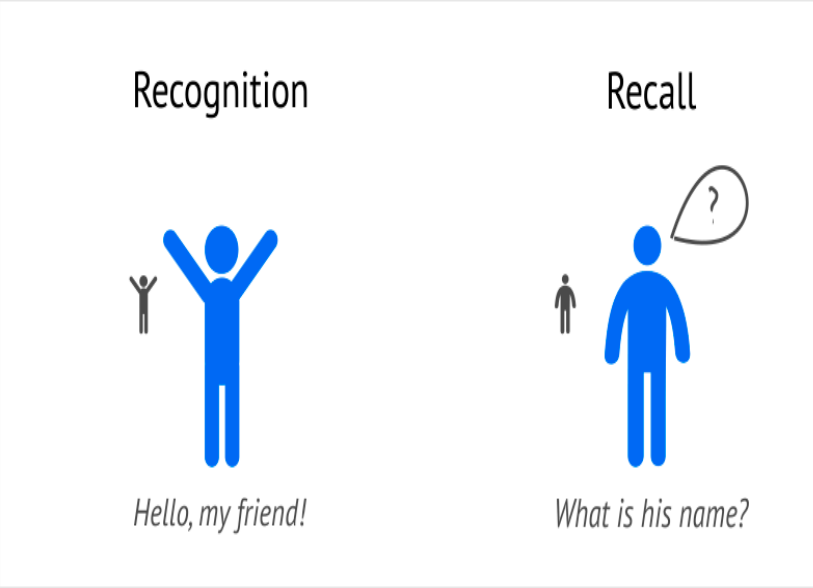
memory for specific events that you have experienced




1. Metamemory defines the ability to monitor one's own memory. It is the knowledge and awareness of one's own memory, including the contents and processes of our own memory.
2. Metamemory also includes the strategies we use to help us remember something

- **For example**, when a person asserts that he or she is good at remembering faces, but poor at remembering names, that person is making a statement concerning metamemory knowledge.

1. **Memory Retention**: is the storage of encoded information in the brain. When a person can recall or retain experiences based on the mental process of recognition or retention of information.
2. **Recognition**: The ability to identify information as having been encountered previously (recollection). It gives the sense of familiarity, the events, objects, or people you have previously encountered.
3. **Recall:** in memory refers to the mental process of retrieval of information from the past.



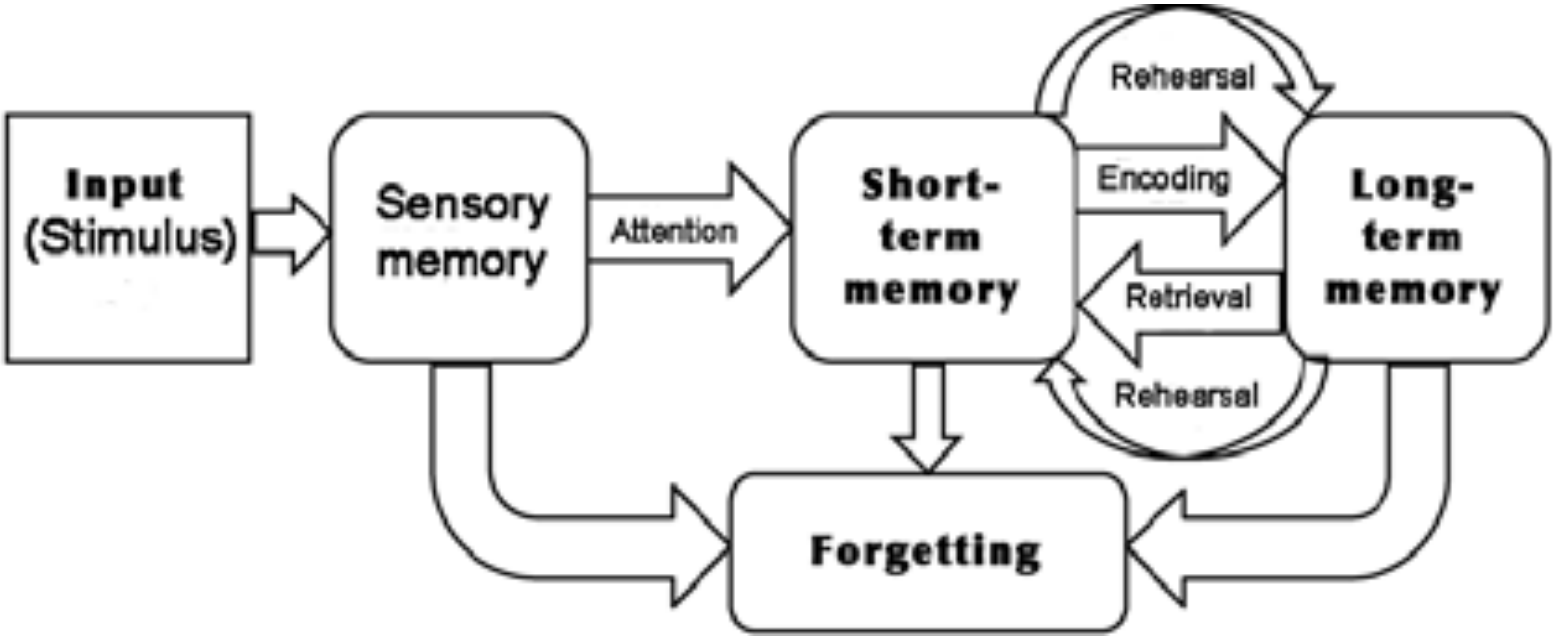



**Figure 1 -** Atkinson-Shiffrin Memory Model. Reprinted from Chang TWK, Chen NS, Yu PT. The effects of presentation method and information density on visual search ability and working memory load. ***Computers and Education*** 2012; 58: 721-731 with permission from Elsevier.[9]

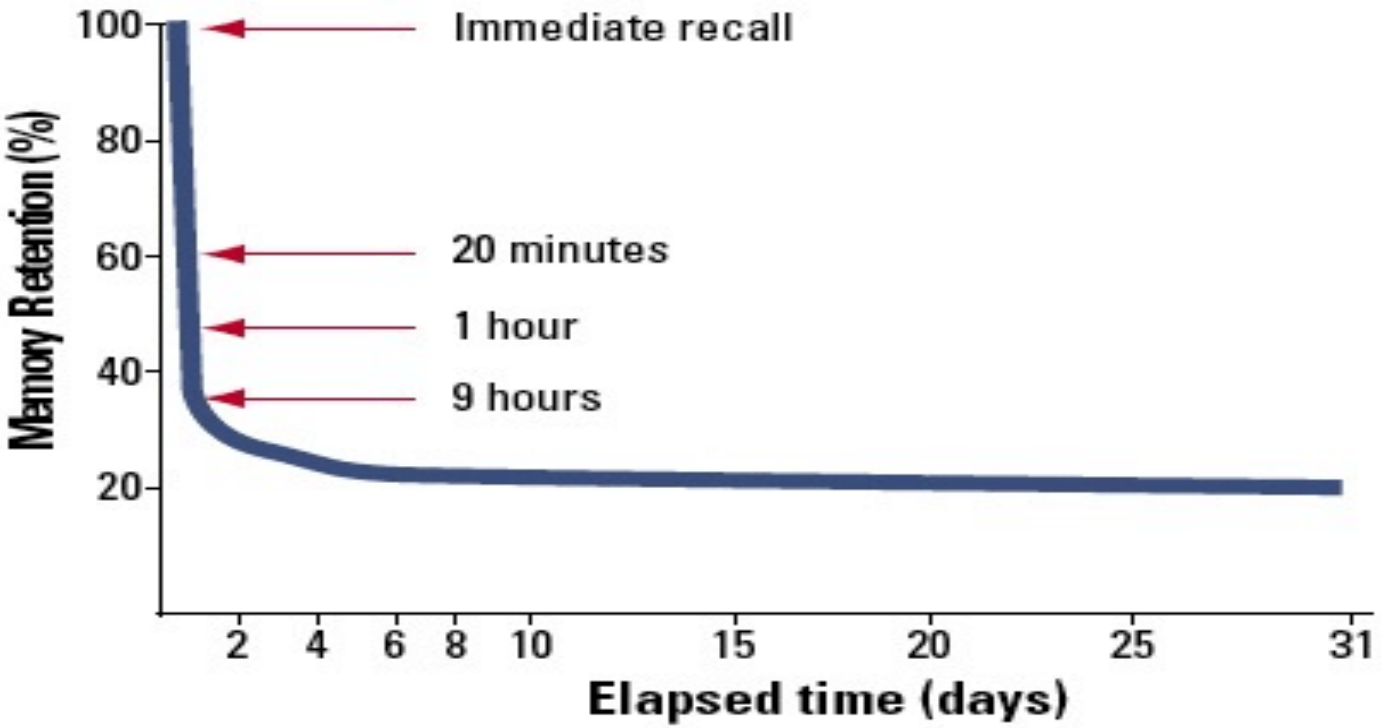
Forgetting: refers to the apparent loss of information already encoded and stored in long-term memory


It occurs due to two reasons:
(i) the information no longer resides in long-term memory. (ii) the information still exists but is not assessible.

Two theories of forgetting:

1. Decay Theory
2. Interference Theory

# The forgetting curve




The "forgetting curve" was developed by Hermann Ebbinghaus in 1885. Ebbinghaus memorized a series of nonsense syllables and then tested his memory of them at various periods ranging from 20 minutes to 31 days. This simple but landmark research project was the first to demonstrate that there is an exponential loss of memory unless information is reinforced.

Stahl SM, Davis RL, Kim D, et al. *CNS Spectr*. Vol 15, No 8. 2010.

Interference Theory of forgetting proposes that the "something" blocking the usual process of retrieval is present in the form of established associations that conflict with what we are trying to recall.

1. Retroactive Interreference: you experience a deficit in recall due to activities intervening between original learning and testing.
2. Proactive Interference: occur when material you have learned under a previous condition produces a decrement in the recall of more recently learned material

**Retroactive Interference**

| | | | | |
|---|---|---|---|---|
| Gp1 | TaskA | TaskB | Recall | Task A (↓) |
| Gp2 | TaskA | Rest | Recall | TaskA (-) |

Proactive Interference

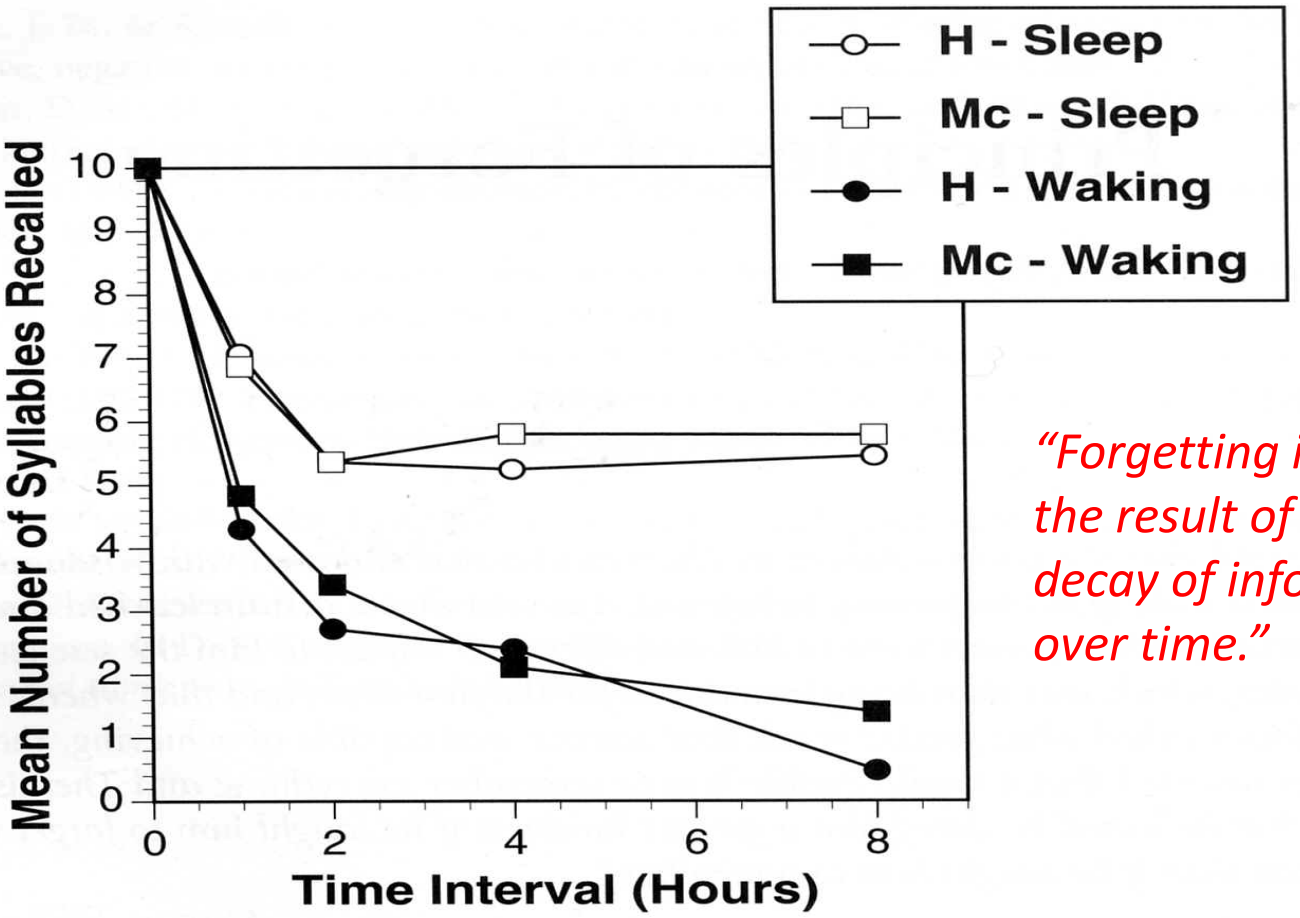
| | | | | |
|---|---|---|---|---|
| Gp1 | TaskA | TaskB | Recall | TaskB (↓) |
| Gp2 | Rest | TaskB | Recall | TaskB (-) |

GDCEIAHBFMN

Decay theory: proposes that memory fades due to mere passage of time. Time plays a major role in forgetting bad events, and also more positive memories.

**Non-sense syllable**

- Pap
- Vath
- Chid
- Whob
- fash




*"Forgetting is primarily the result of gradual decay of information over time."*

Figure 7.1 Mean number of syllables correctly recalled by two subjects who either slept or remained awake for varying time intervals after learning. Source: Jenkins & Dallenbach (1924).

**Amnesia:** involves forgetting under conditions of severe psychological or physical trauma


**Anterograde amnesia**: In this form of amnesia there is problem with encoding. (for e.g. someone might remember how to make a phone call but they don't remember what they did earlier this morning. )


**Retrograde amnesia**: In this form of amnesia the memory loss is for information acquired prior to the point of trauma. (for e.g. someone might forget whether or not they own a car, what type it is, and when they bought it)

# Test

1. Explain different stages of memory? (Row1)
2. What is encoding? (Row1)
3. Explain types of memory? (Row2)
4. What is long-term memory? (Row2)
5. What is sensory memory? (Row3)
6. Explain iconic and echoic memory with an example. (Row3)
7. Explain serial-position effect in detail? (Row4)
8. What is recency effect? (Row4)

# THANKS!

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