

# QUIZ

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- ❑ Which theory says that we have a sample for every letter and its orientation in our memory? What are the disadvantages of the theory?
  - ❑ What is the difference between bottom-up and top-down perception? Can you give examples?
  - ❑ What are some of the features that Anne Treisman names in her theory?
  - ❑ What are functions of attention?
  - ❑ Can you provide at least two theories of attention? ( and describe the difference between them?)
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# Memory

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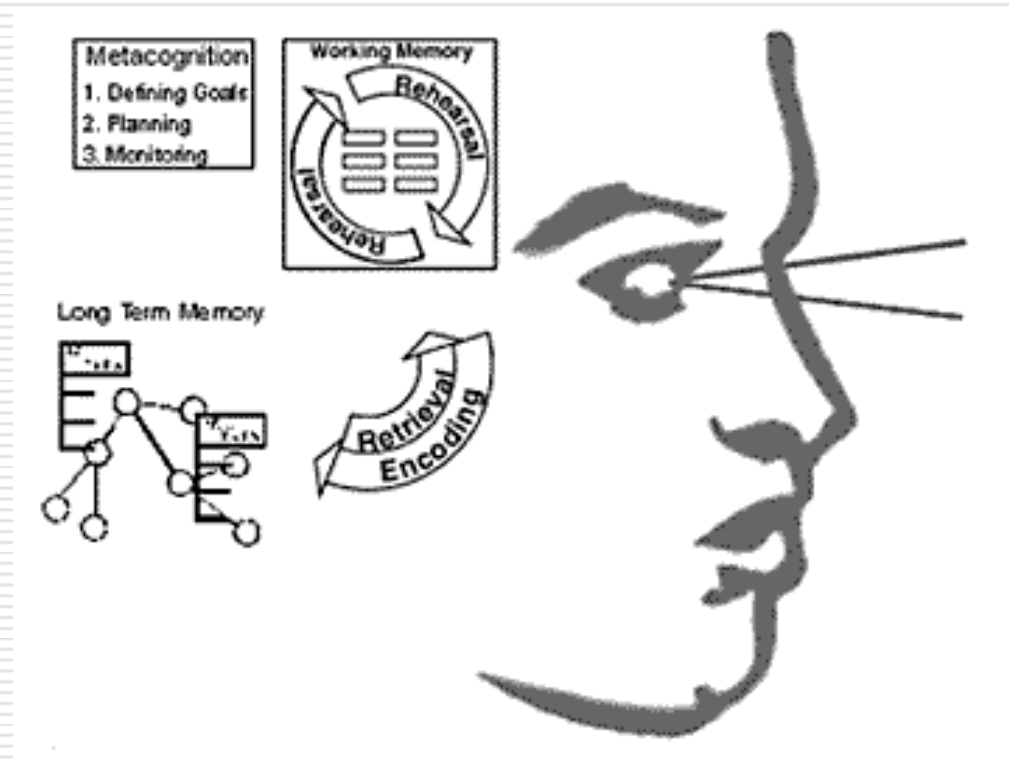


- ❑ 1. mental capacity to store information
  - ❑ 2. information stored in our memory
  - ❑ 3. recall of information that I am trying to utilize at the moment
  - ❑ 4. dynamic processes used in the retention and recall/ recognition of information
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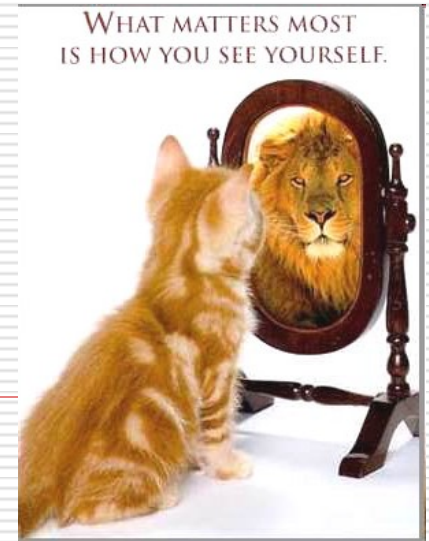
# 3 basics mechanisms of memory

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- ❑ Encoding
- ❑ Storage
- ❑ Retrieval



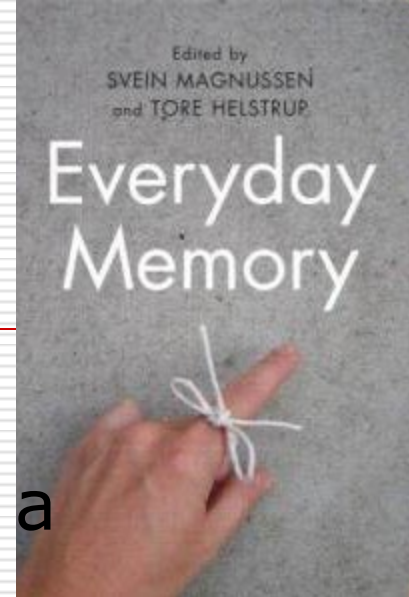
- 
- Our sense of self and personal history arises from our experiences – but we only know of these experiences through our recollections.
  - Are we, then, just a product of our memories?



# Everyday memory

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- ❑ Memory is selective.
  - ❑ Recovering a memory is not playing a videotape
    - Memory involves inferences that fill in gaps in recall.
    - We are often unaware we have made such inferences.
  - ❑ **Source Amnesia:** The inability to distinguish what you originally experienced from what you heard or were told later about an event.
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# Confabulation

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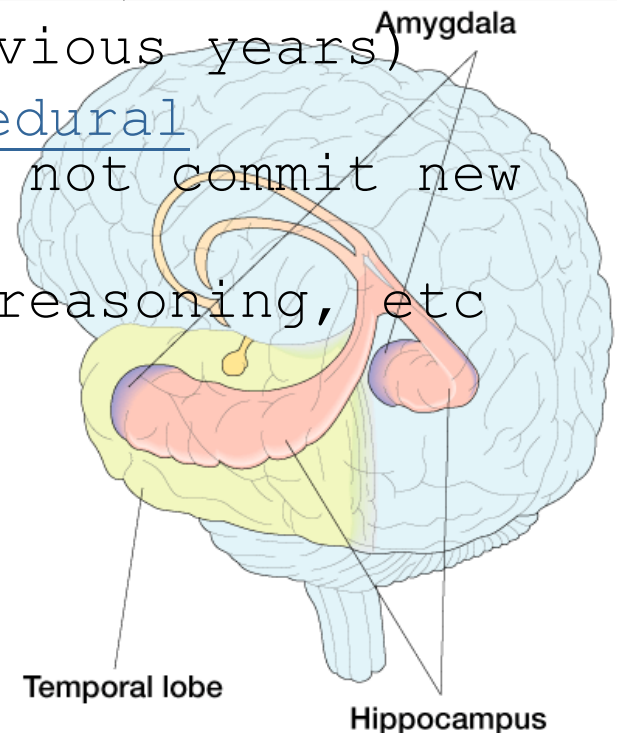


- ❑ **Confabulation:** Confusion of an event that happened to someone else with one that happened to you, or a belief that you remember something when it never actually happened.
  - ❑ Confabulation is most likely when:
    - You have thought about the event many times
    - The image of the event contains many details
    - The event is easy to imagine
    - You focus on emotional reactions to the event rather than what actually happened.
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# Patient H.M.

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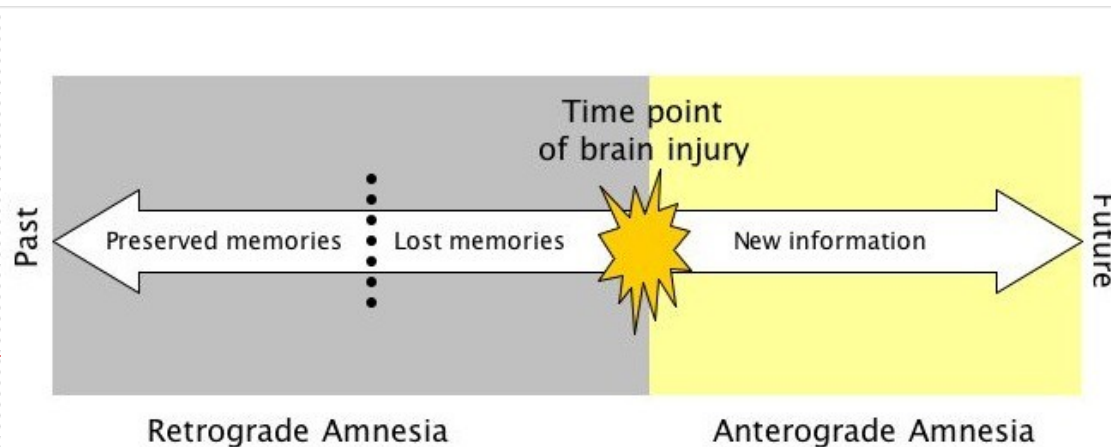
- Brain surgery for epilepsy in 1953
- • Parts of medial temporal region removed
- • Including the hippocampus (and more)
- • Specific anterograde amnesia (and some retrograde amnesia for 3 previous years)
- his working memory and procedural memory were intact, he could not commit new events to long-term memory
- • No problem in perception, reasoning, etc
- • Died, November 2008.





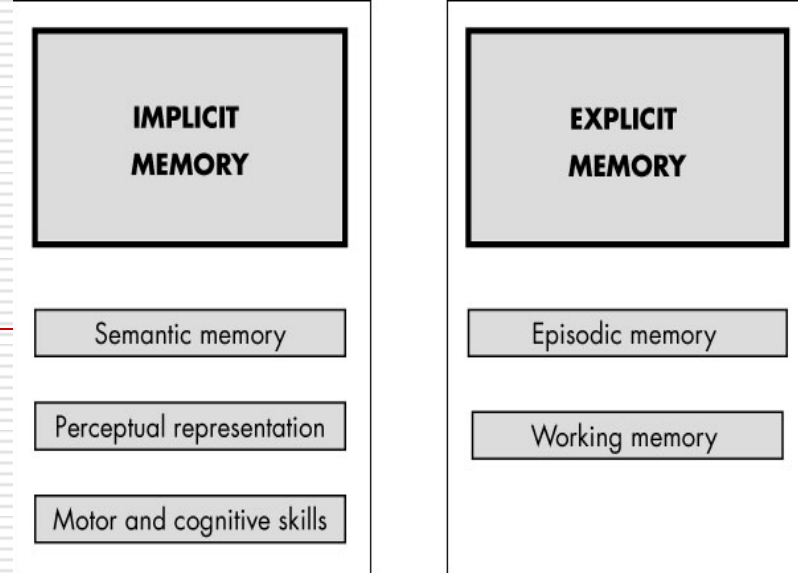
# Amnesias

- Memories for recent and remote events involve different structures.
- • **Retrograde Amnesia** - loss of memory for events preceding the lesion.
- • **Anterograde Amnesia** - loss of memory for events following the lesion.



# Types of memory I

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- **Explicit Memory:** Conscious, intentional recollection of an event or of an item of information.
  - **Implicit Memory:** Unconscious retention in memory, as evidenced by the effect of a previous experience or previously encountered information on current thoughts or actions.
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# Explicit Memory

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- **Recall:** The ability to retrieve and reproduce from memory previously encountered material.
  - **Recognition:** The ability to identify previously encountered material.
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□ Black Grape Horse School  
Fish Student Bird Yellow Kiwi  
Blue Green Chair Mango  
Desk Bookcase Bed Teacher  
Table Homework Class Apple  
Dog Banana Orange Cat

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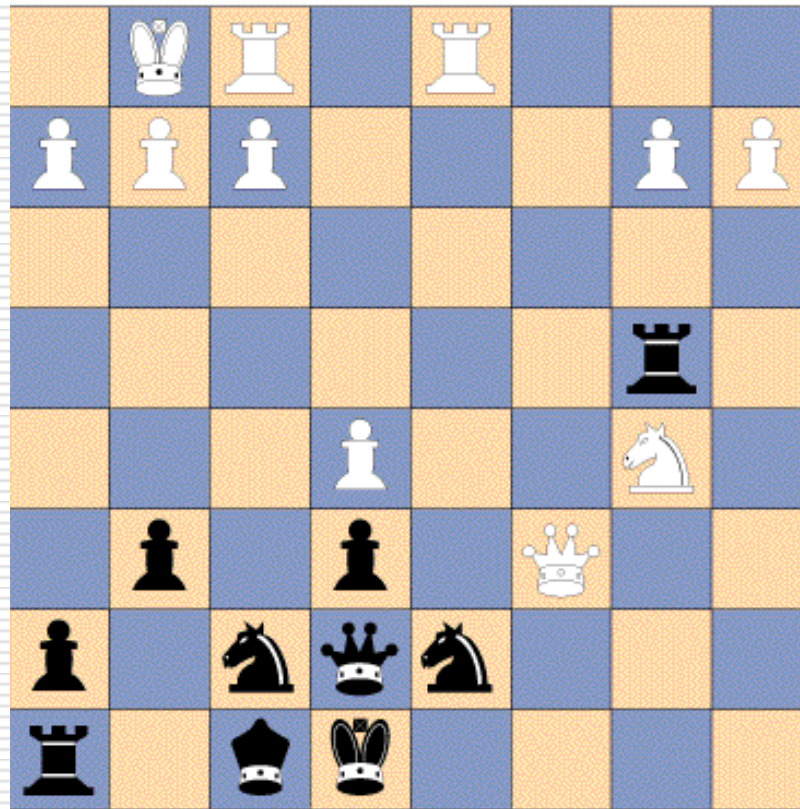
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□ Horse Brown Notebook Dog Pear Bird  
Orange Yellow Blue Purple Black  
Table Chair Desk Bookshelf Teacher  
School Pupil Homework Classroom  
Banana Kiwi Grape Bed

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You have 5 seconds to memorize  
as much as you can  
Then, draw an empty chess board  
and reproduce the arrangement of  
pieces

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□ Chunking?

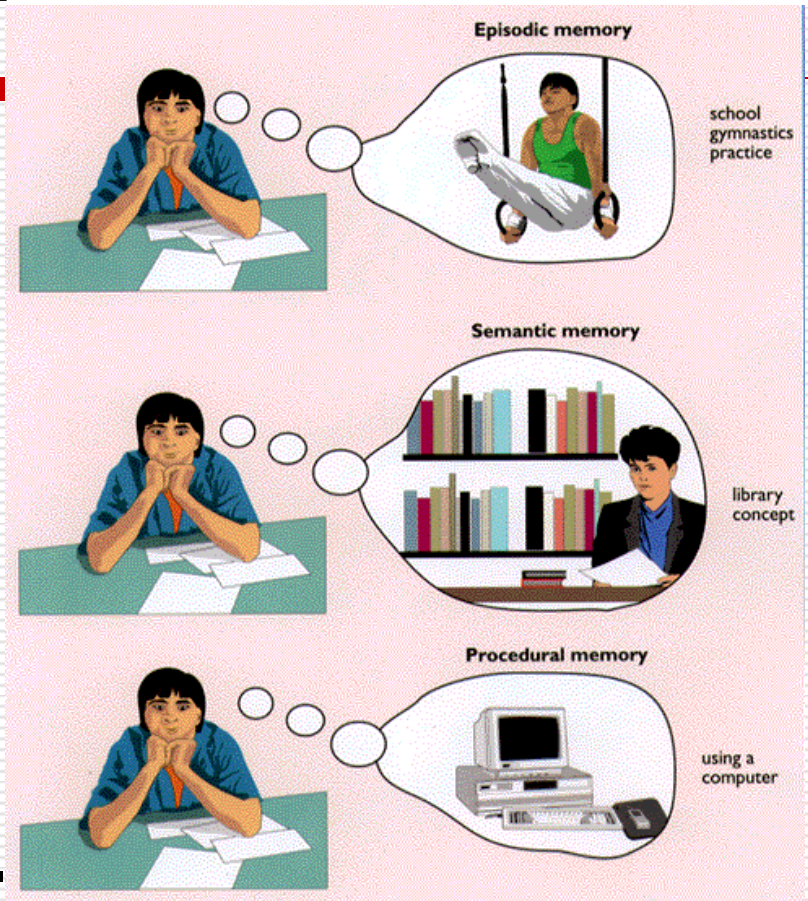
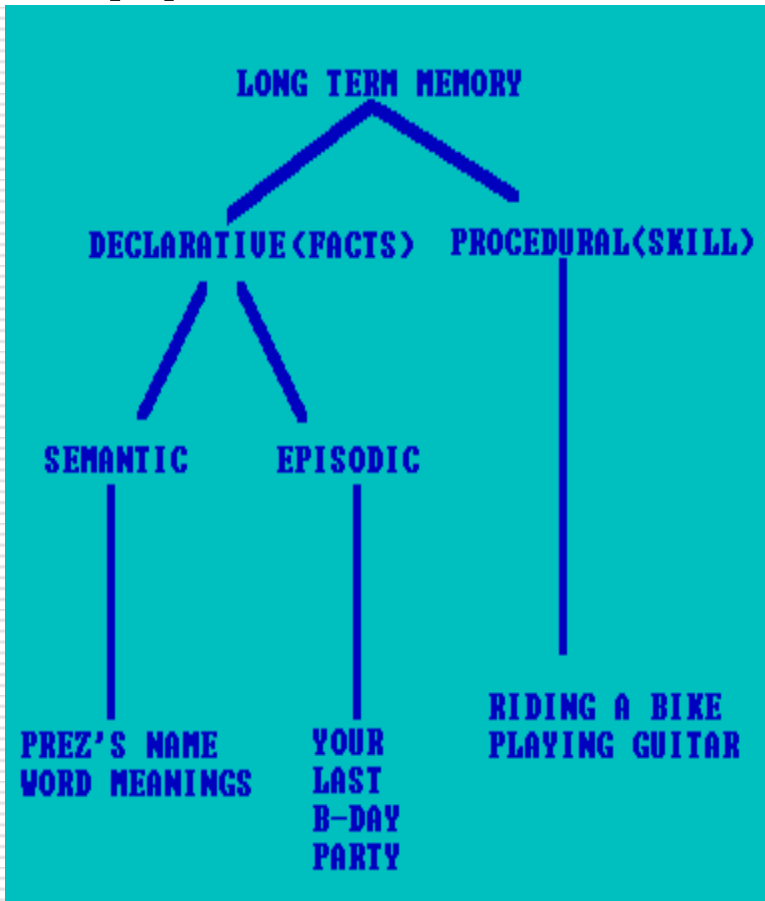
**(Chunk:** A meaningful unit of information; it may be composed of smaller units.)

Confusion?

Recall or recognition?

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# Types of memory



mat.

how to ...)



# What is Memory?

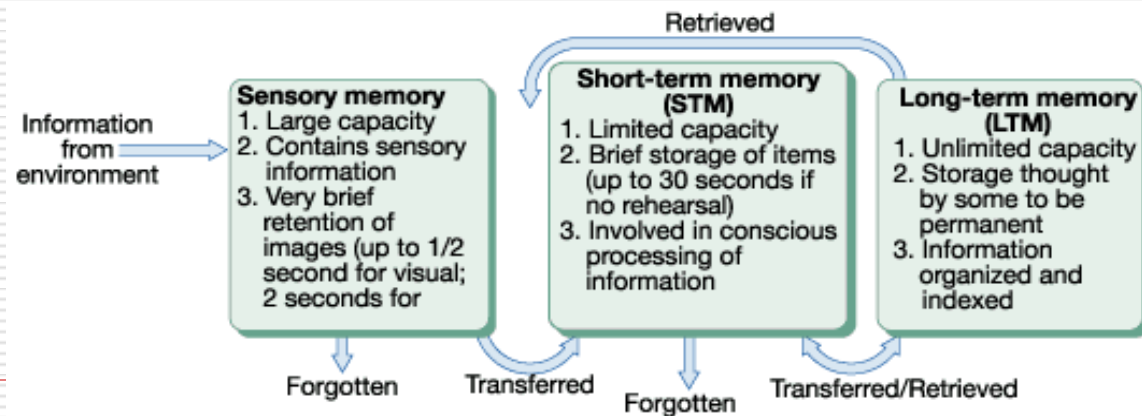
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- Memory for facts:
  - *New York is located in the USA.*
  - Declarative memory... what other kind could there be?
  - .... Remembering how to tie your shoelaces
  - .... Remembering how to ride a horse
  - Declarative vs Procedural Memory
  - (Remembering that.... vs remembering how to ....)
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# Three-storage Model of Memory

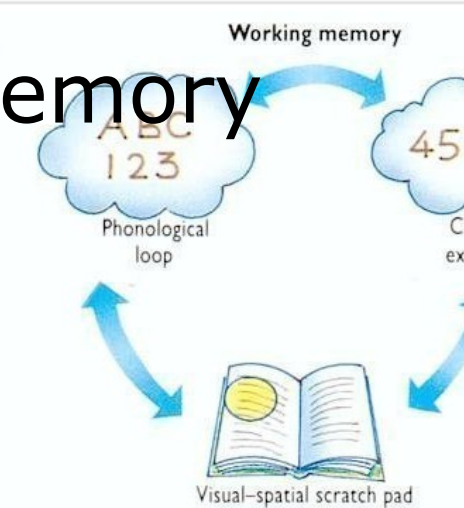
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- ❑ Sensory Memory: Fleeting Impressions
- ❑ Short-term Memory: Memory's Scratch Pad
- ❑ Long-term Memory: Final Destination



# Short Term Memory/Working Memory

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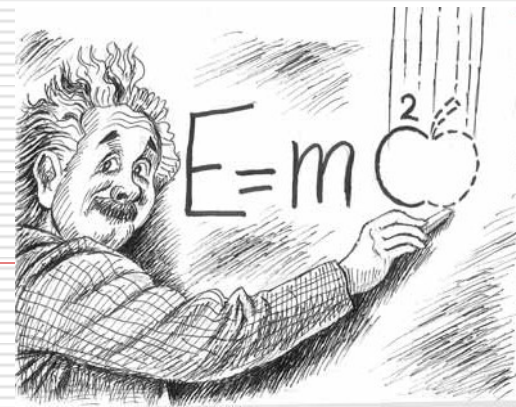


- Theorists differ a lot here
  - • WM acts as an active area in which items are kept at the forefront of attention
  - • Preserved by *rehearsal*
  - • An old theory due to George Miller
  - suggested a capacity of  $7 \pm 2$  'items'
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# Rehearsal

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- ❑ **Maintenance Rehearsal:** Rote repetition of material in order to maintain its availability in memory.
- ❑ **Elaborative Rehearsal:** Association of new information with already stored knowledge and analysis of the new information to make it memorable.

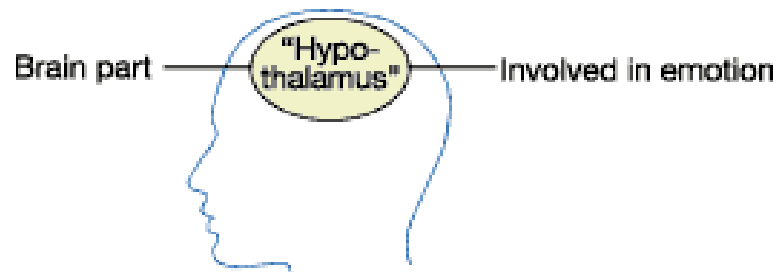


# rehearsal

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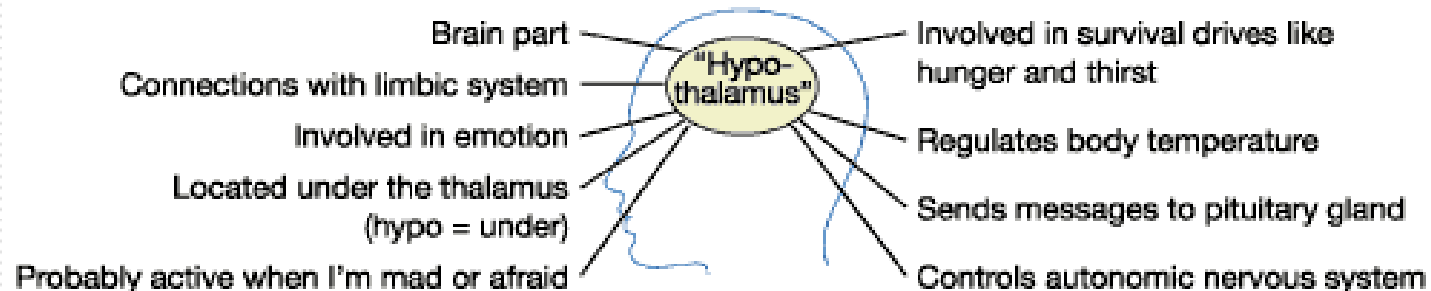
## IMPOVERISHED ENCODING

(poor retention)



## ELABORATE ENCODING

(good retention)



# Memory techniques- mnemonics

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- <http://www.youtube.com/watch?v=V8S8V9VEFyI&feature=related>
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# Theories of forgetting

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- Decay
  - Interference
  - Cue-dependent forgetting
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# Decay

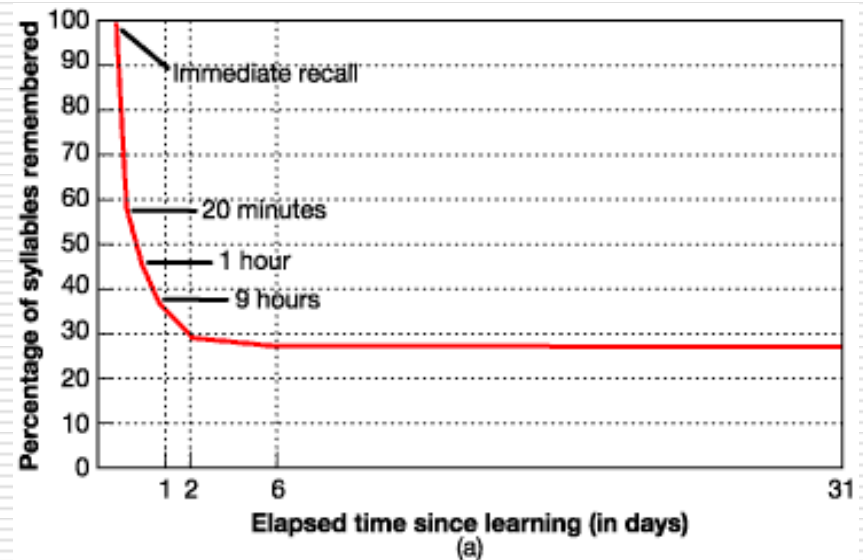
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- **Decay Theory:** The theory that information in memory eventually vanishes if it is not accessed (it is valid more to short-term than to long-term memory)
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# Forgetting Curve

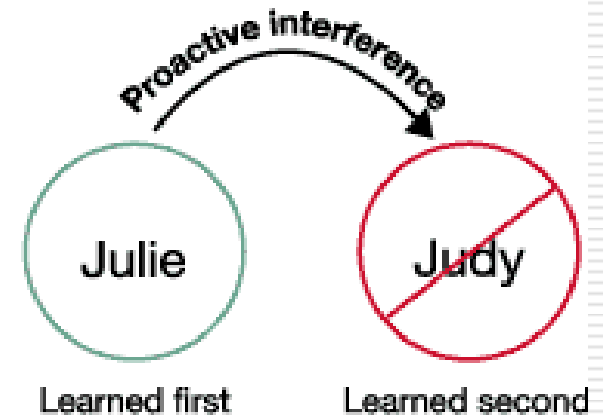
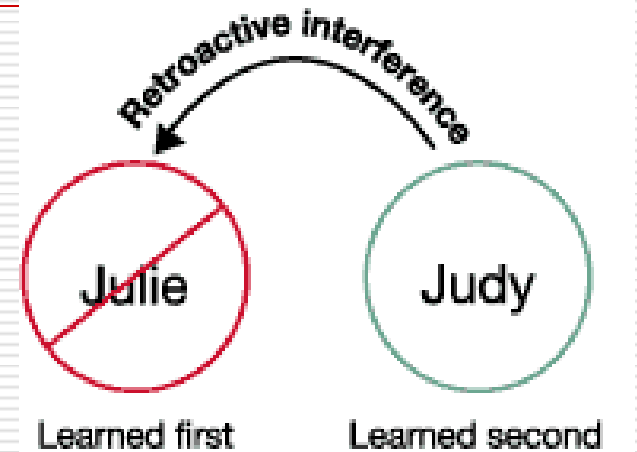
- Herman Ebbinghaus tested his own memory for nonsense syllables.
- Forgetting was rapid at first and then slowly stagnated



# Interference

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- ❑ **Retroactive Interference:** Forgetting that occurs when recently learned material interferes with the ability to remember similar material stored previously.
- ❑ **Proactive Interference:** Forgetting that occurs when previously stored material interferes with the ability to remember similar, more recently learned material.

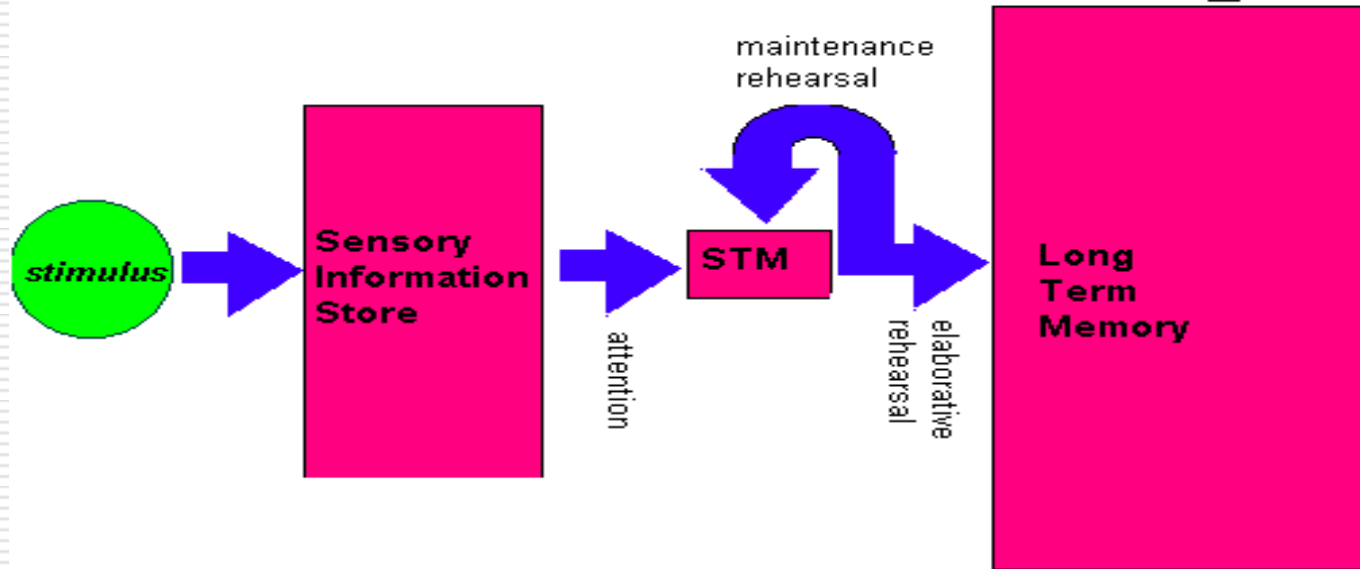


# Cue-dependent Forgetting

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- ❑ **Cue-Dependent Forgetting:** The inability to retrieve information stored in memory because of insufficient cues for recall.
  - ❑ *„searching for a book in a library without the reference number, title, author or even subject „*
  - ❑ **State-Dependent Memory:** The tendency to remember something when the person is in the same physical or mental state as during the original learning or experience.
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# *Atkinson and Shiffrin*



# Sensory memory

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- Great capacity
  - Time limitation
  - 2 sec
  - Attention necessary for further processing
  - Fast decay of information
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# Sensory memory (iconic memory)

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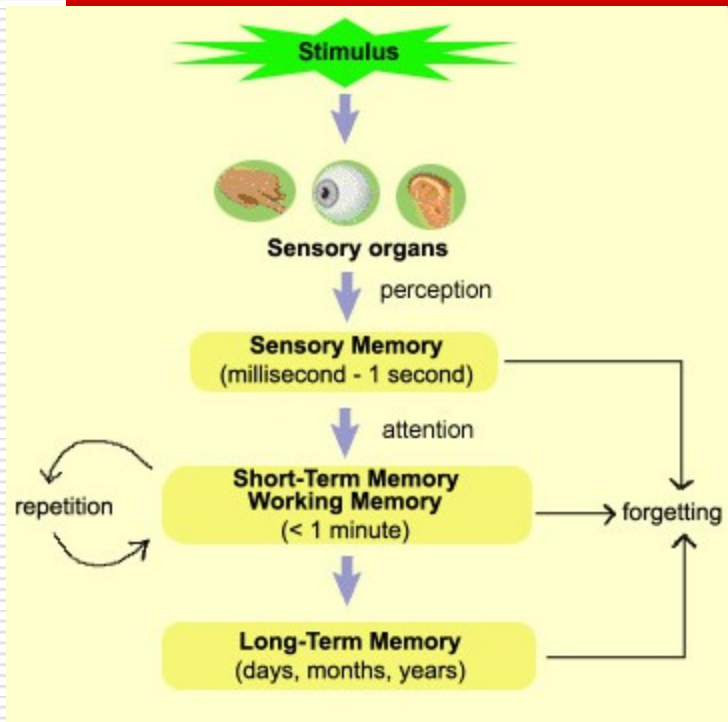
- Research of George Sperling
- Latency : 50ms

A	M	X	C
V	K	O	M
N	R	Y	J

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# Transfer of info from SM to STM

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- attention= “ a gate” between SM and STM
  - Relevance of information
  - Selectivity of attention
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# Selectivity of attention

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[http://www.youtube.com/watch?v=IGQmdoK\\_ZfY](http://www.youtube.com/watch?v=IGQmdoK_ZfY)

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# Short-term memory

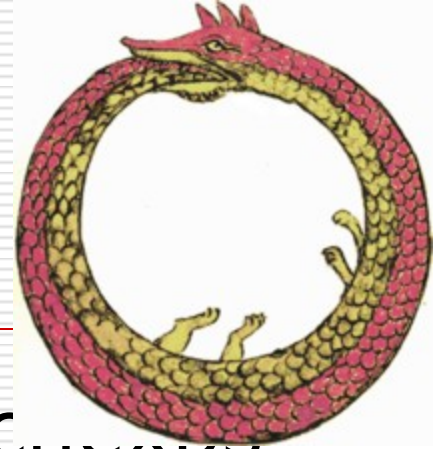
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- ❑ Information flowing constantly
- ❑ How to retain info?
- ❑ Attention but also maintenance rehearsal
- ❑ If information is not processed it vanishes after 15-30 s

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“We got married on Cup Final Day so that he wouldn't forget our anniversary.”



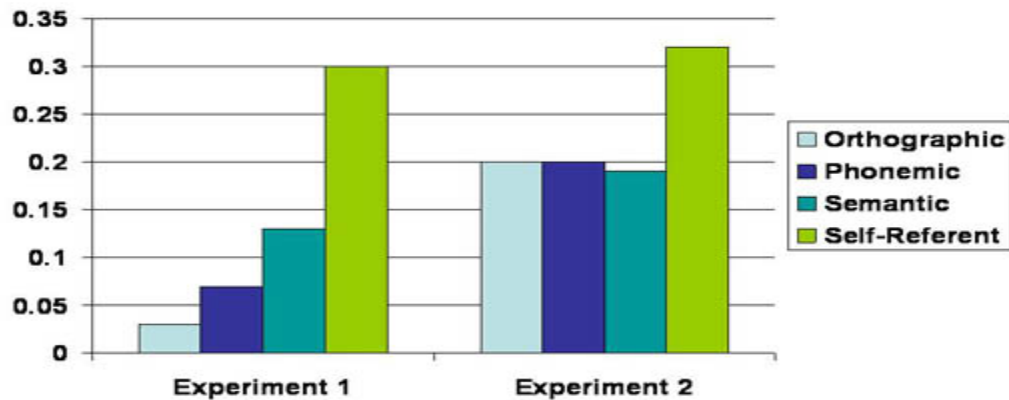
# Self-reference effect

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- [http://www.psych.uni.edu/psych/exps/exps/Self\\_Reference/selfref99.htm](http://www.psych.uni.edu/psych/exps/exps/Self_Reference/selfref99.htm)

## The Self-Reference Effect

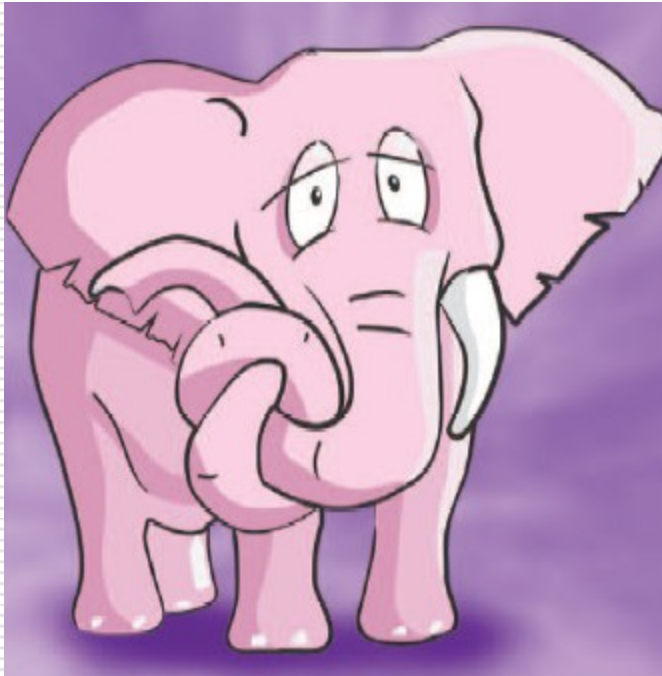
Rogers et al. (1977), Exps. 1 & 2



# Long-term memory

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- “relatively” unlimited (time and space-wise)



# Document about memory

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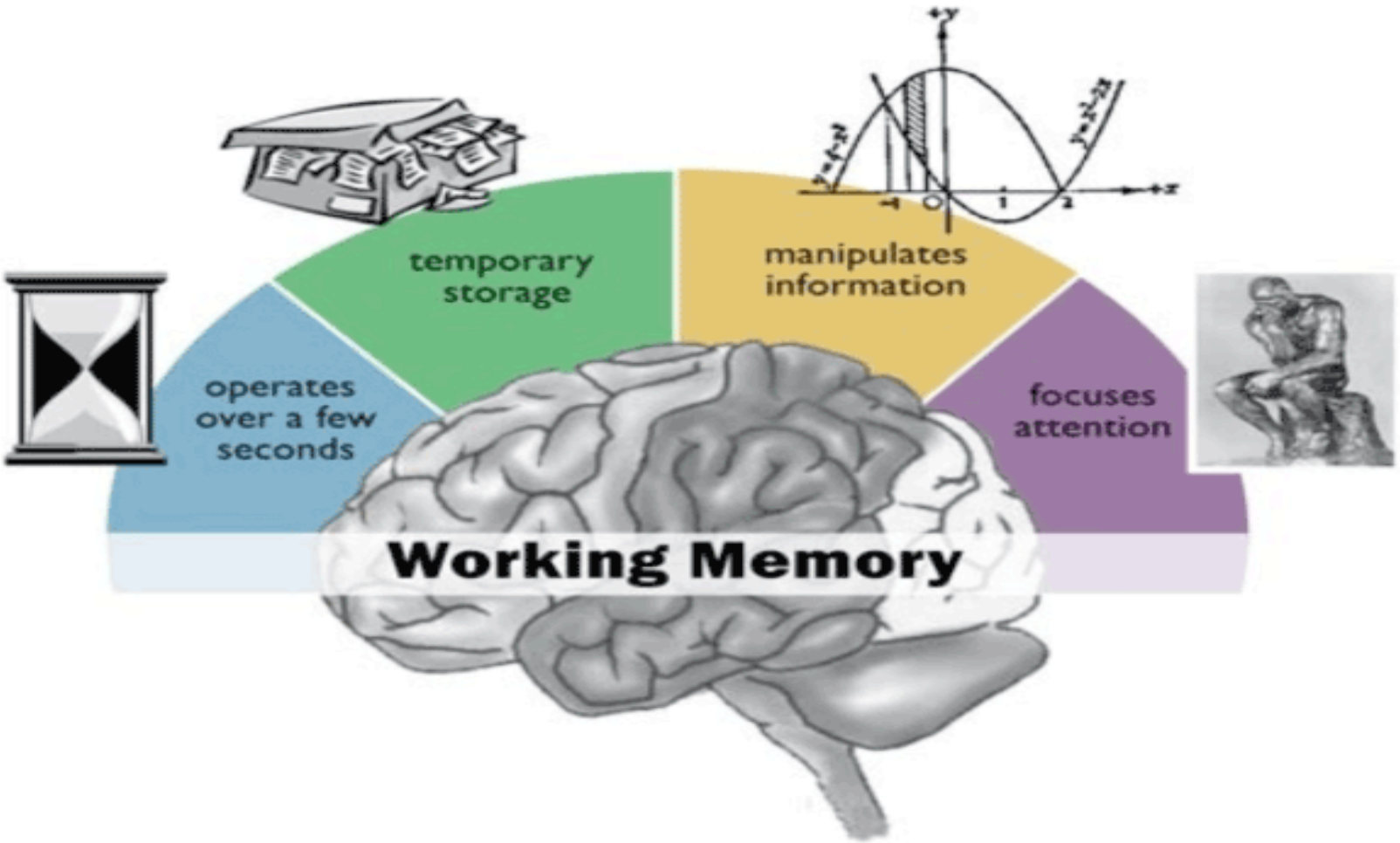
- <http://www.youtube.com/watch?v=4sWnkBf5V7s&feature=related>
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# Long-term memory loss

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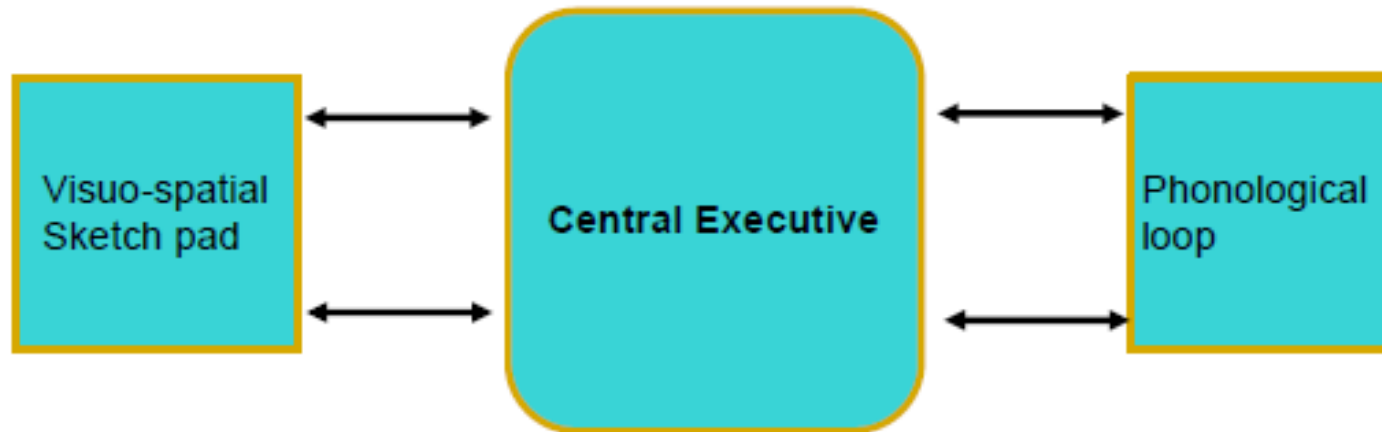
- <http://www.youtube.com/watch?v=WmzU47i2xgw&feature=related>

# Baddeley- working memory



# Working memory: Alan Baddeley

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- These three components are all assumed to have limited capacity.
- They are also assumed to be mostly independent of each other.
- This predicts that:
  - if two tasks require use of the component, then they cannot be successfully completed at the same time.
  - if two tasks require different components, then they can be successfully completed at the same time.

# Baddeley- working memory

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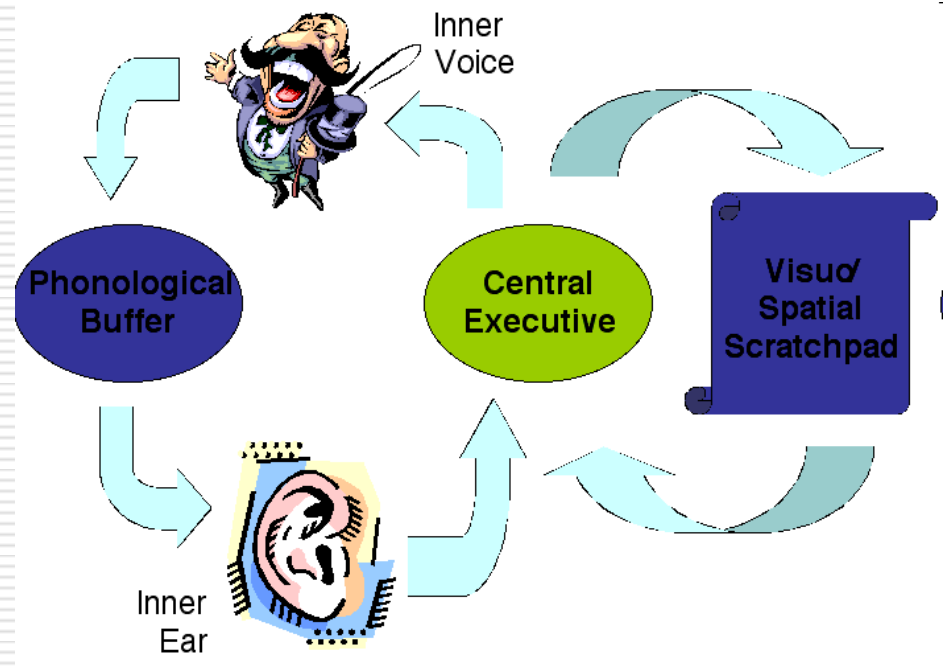
- ❑ Central Executive: meters out *attention*
  - ❑ Phonological loop: sub-vocal rehearsal
  - ❑ Visuo-spatial sketchpad: non-verbal information
  - ❑ (visual, movement, etc)
-



# Central Executive/ „supervisor“

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- binding information from a number of sources into
- coherent episodes
- coordination of the slave systems
- shifting between tasks or retrieval strategies
- selective attention and inhibition



# Phonological Loop

- Processes sound or phonological information
- *phonological store and articulatory rehearsal component /loop*

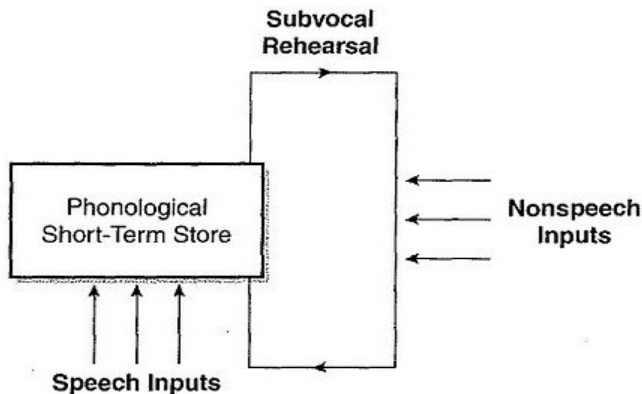


FIGURE 5.2 The Phonological Loop, with the Phonological Store and the Articulatory Loop

Source: Baddeley, 1986

# Phonological Loop

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## - Mental Rehearsal

Which list is easier to retain in memory?

Z L Q T N K S R

P B G V C T D E

cup hat ball tree fork top door pin

refrigerator hippopotamus  
encyclopedia.....

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# Phonological Loop

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- Items which sound similar are more easily to be confused because storage of information is based on the sound of the item (sub-vocal rehearsal)
  - Longer words take up more 'space': they exert WM, so less information is remembered
-

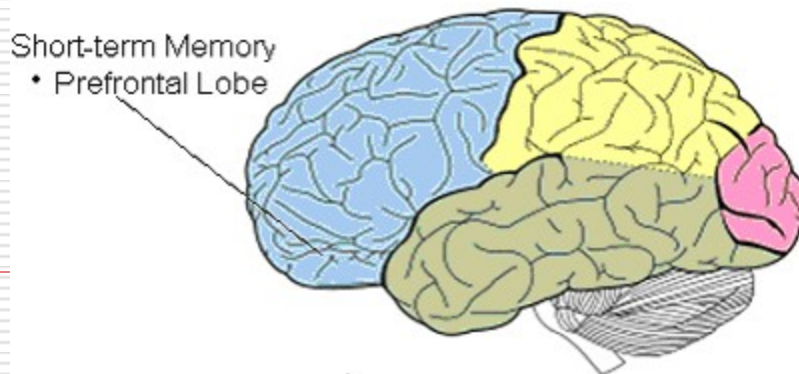
# Visuospatial sketchpad

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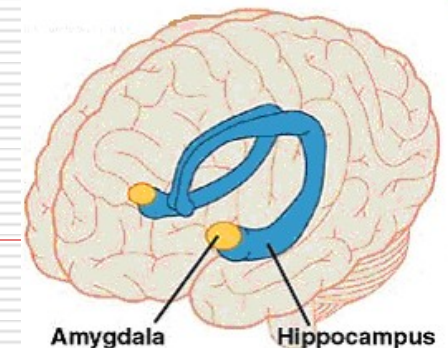
- hold information about what we see = visual information
  - manipulation of spatial and visual information
-

# STM/WM vs LTM

- Short Term Memory is: Time-limited
- (max ca 30 sec)
- Content limited
  
- prefrontal cortex
- dial a phone number someone just told you



- Long Term Memory is:
- Of Indefinite Duration
- Virtually unlimited
- even permanently on the basis of meaning and importance



# Autobiographical Memory

**1 for Context (overcast)**

**2 for Times (Thursday afternoon)**

**1 for Details (the rock to land on!)**

**1 for Feeling (Ahhhhh!)**

**2 for Episodes (before  
and after jumping)**

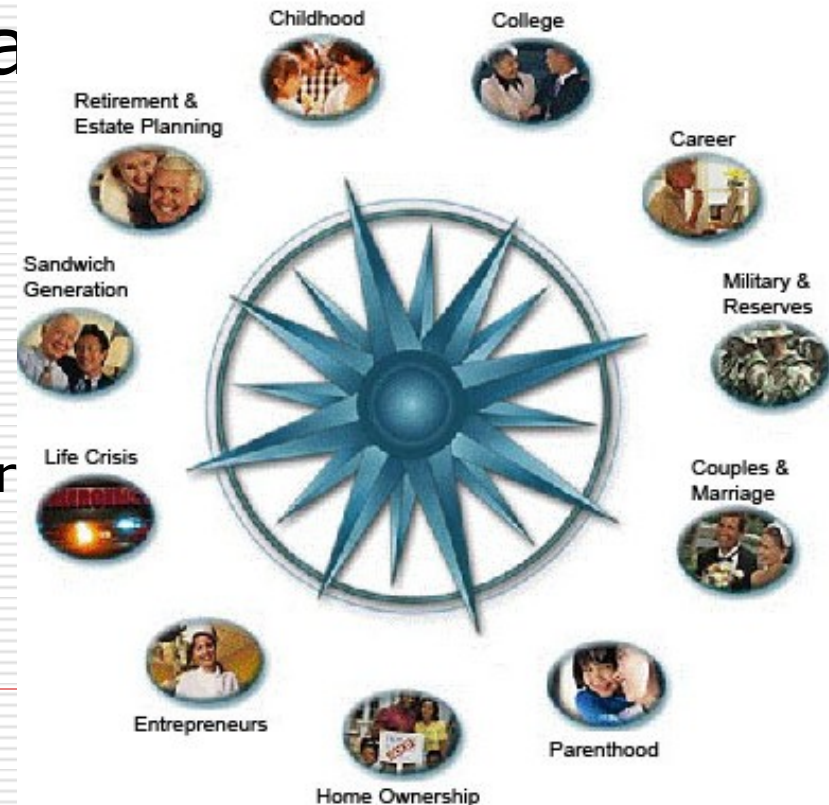


# Autobiographical Memory

- **The reminiscence bump:** people recall a disproportionately large number of autobiographical memories of events that happened when they were about 15-25 years of age

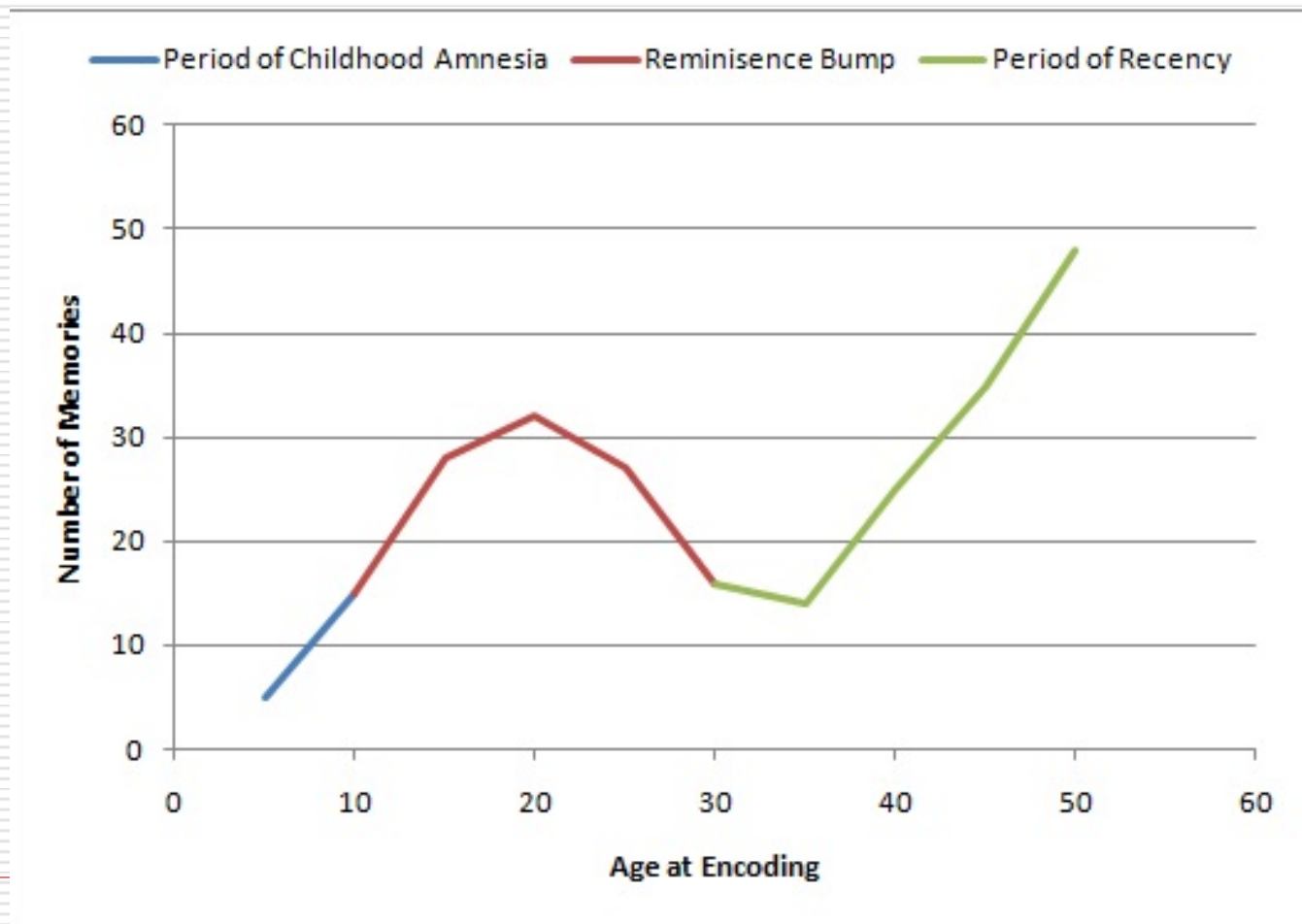
- **WHY?**

- *memories linked to self-identity*
- *biological/ maturational account*
- *the cognitive account – novel exper*





# Autobiographical Memory



# Autobiographical Memory

- **A period of recency:** people recall more autobiographical memories of events that happened more recently in their lives.
- Recall Ebbinghaus

