

QUIZ

- ❑ 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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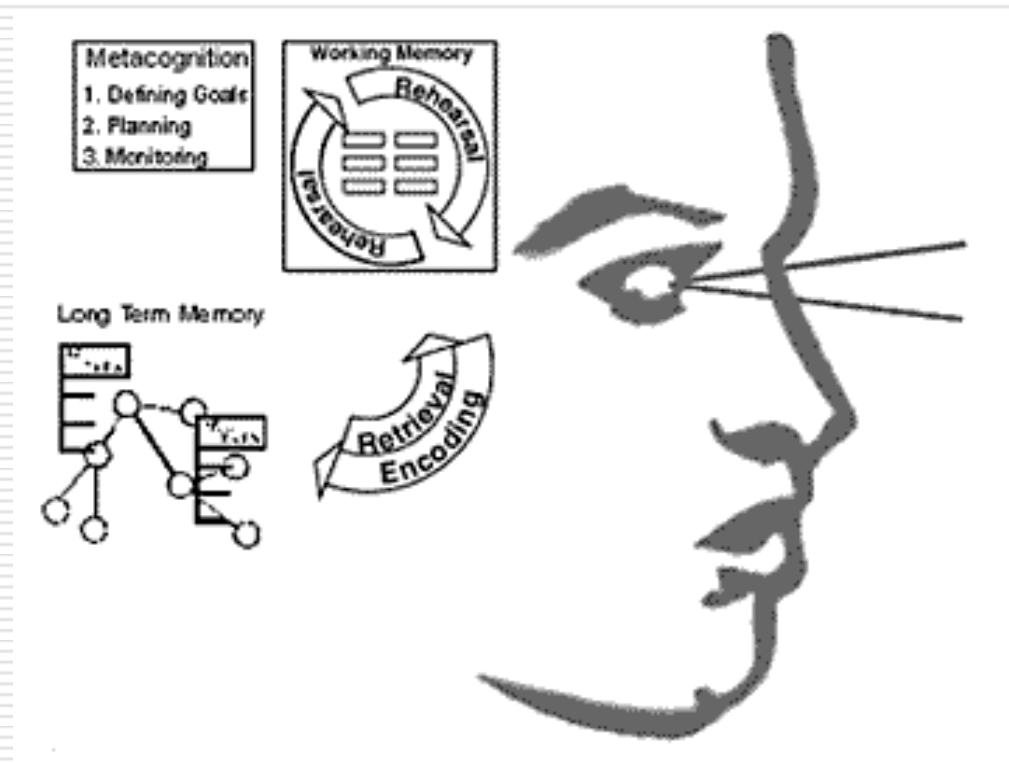
Memory



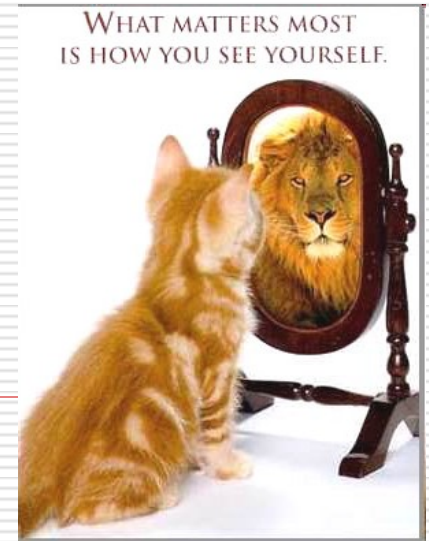
- ❑ 1. mental capacity to store information
 - ❑ 2. information stored in our memory
 - ❑ 3. recall of information that I am trying to utilize at the moment
 - ❑ 4. dynamic processes used in the retention and recall/ recognition of information
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3 basics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

- ❑ Encoding
- ❑ Storage
- ❑ Retrieval

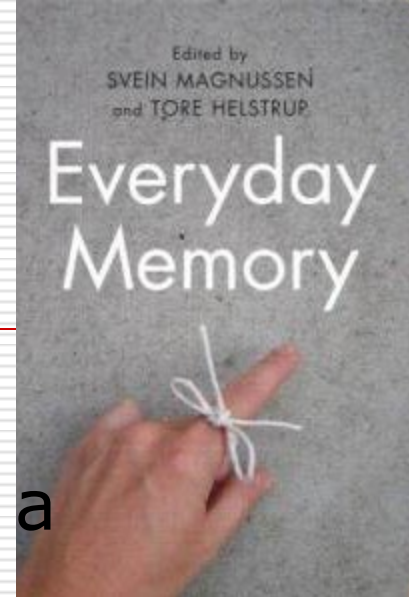


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- Our sense of self and personal history arises from our experiences – but we only know of these experiences through our recollections.
 - Are we, then, just a product of our memories?



Everyday memory

- ❑ 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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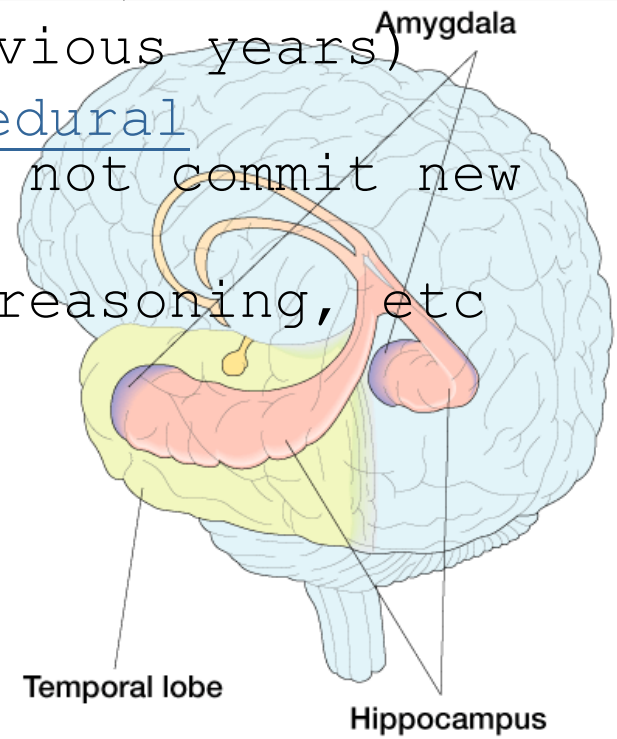
Confabulation



- ❑ **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.
-

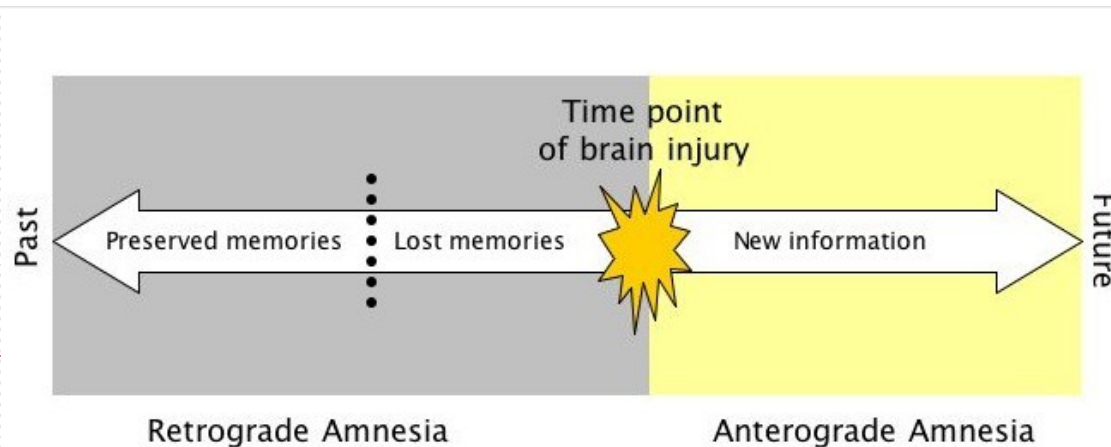
Patient H.M.

- 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.

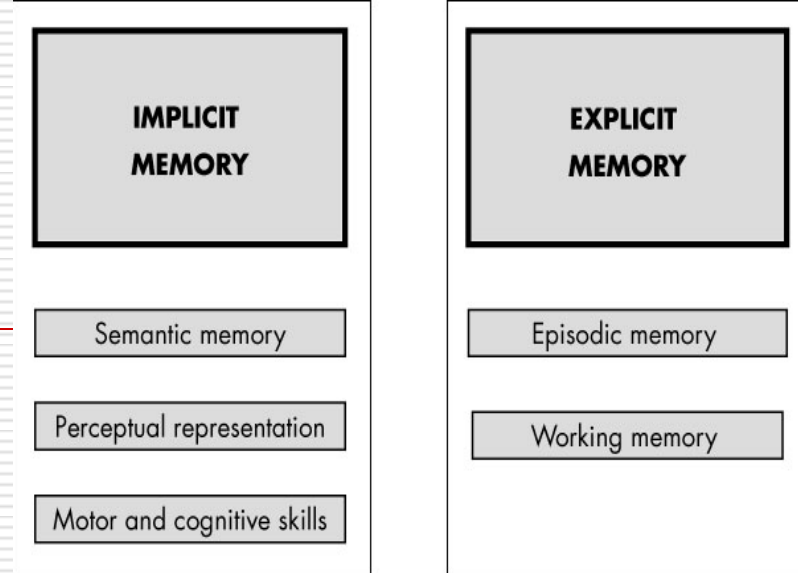


Amnesias

- 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



- **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.
-

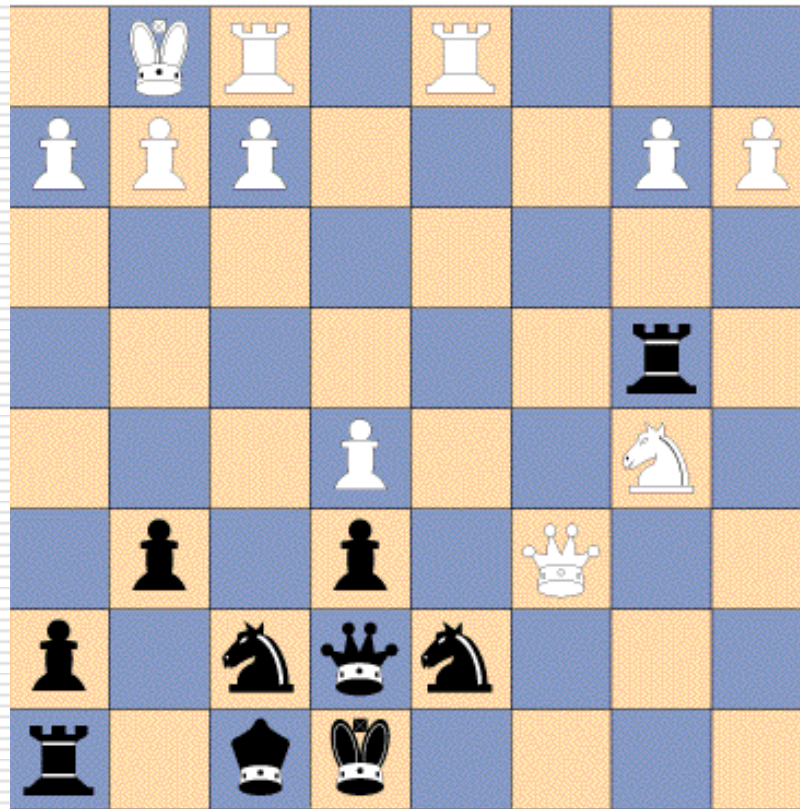
Explicit Memory

- **Recall:** The ability to retrieve and reproduce from memory previously encountered material.
 - **Recognition:** The ability to identify previously encountered material.
-

□ 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

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

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



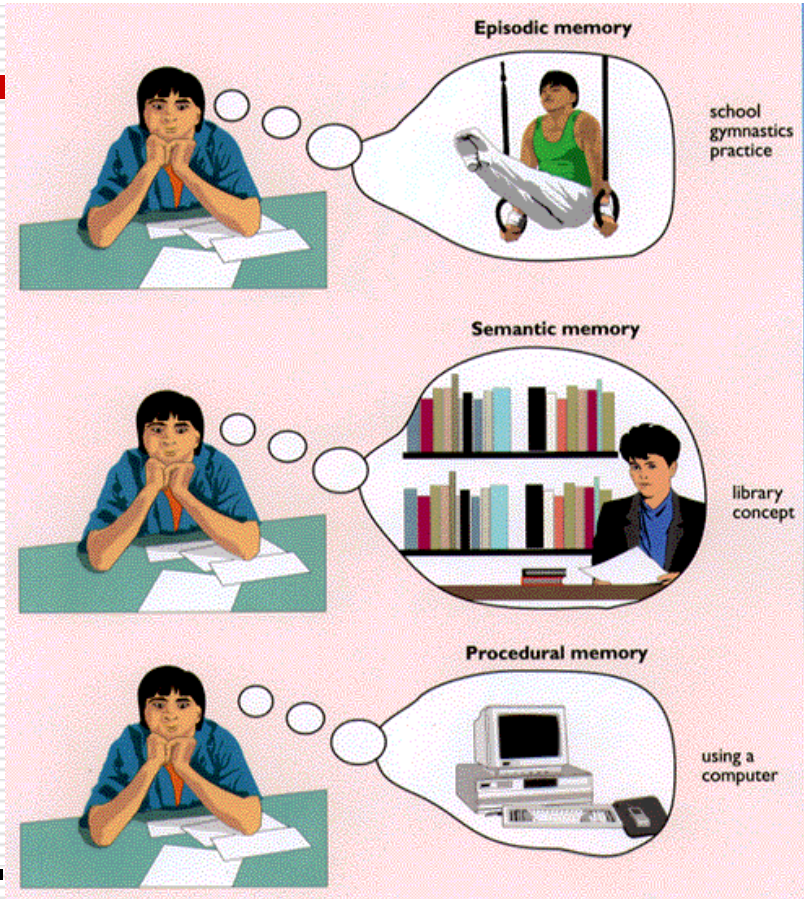
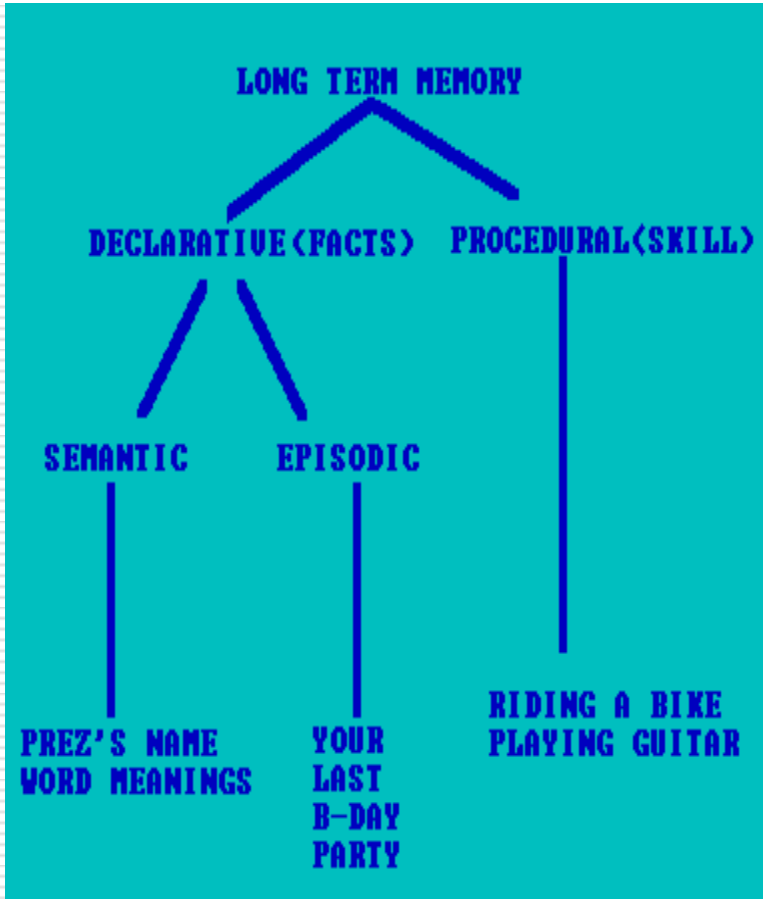
□ Chunking?

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

Confusion?

Recall or recognition?

Types of memory



mat.

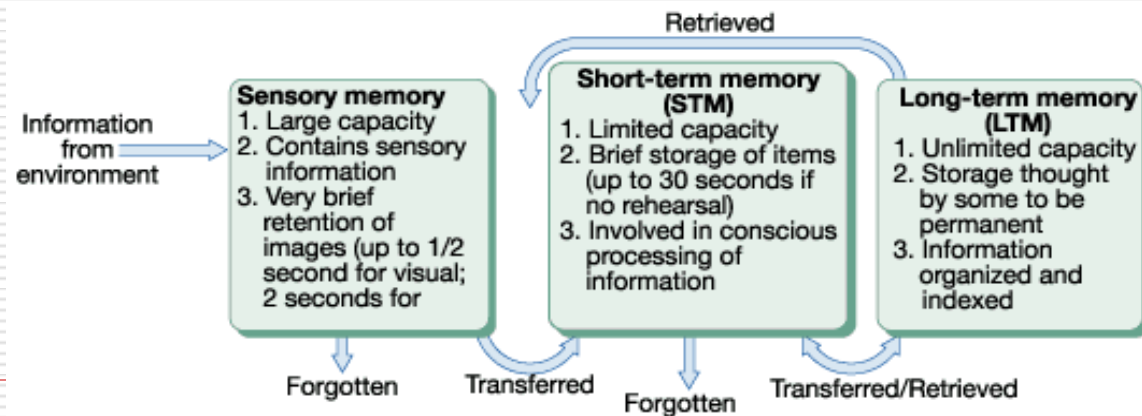
how to ...)

What is Memory?

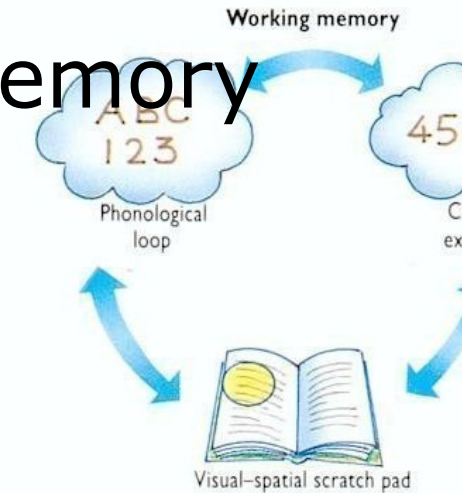
- Memory for facts:
 - *New York is located in the USA.*
 - Declarative memory... what other kind could there be?
 - Remembering how to tie your shoelaces
 - Remembering how to ride a horse
 - Declarative vs Procedural Memory
 - (Remembering that.... vs remembering how to)
-

Three-storage Model of Memory

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



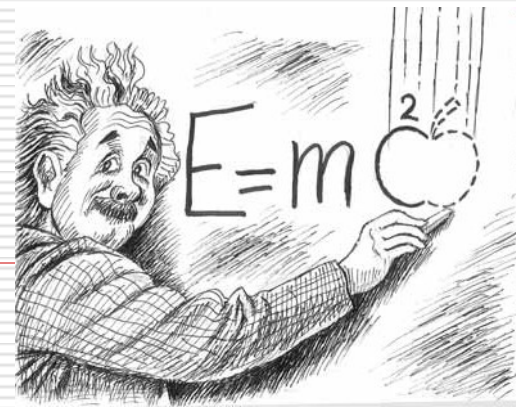
Short Term Memory/Working Memory



- ❑ 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 ± 2 'items'
-

Rehearsal

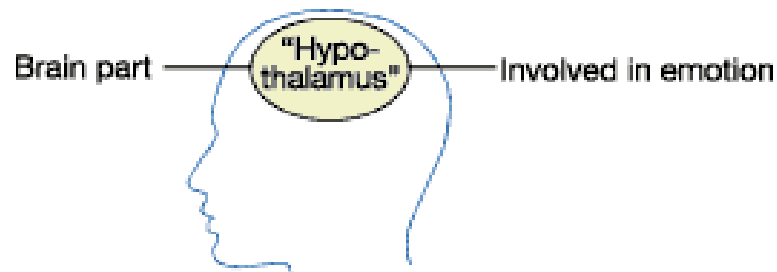
- ❑ **Maintenance Rehearsal:** Rote repetition of material in order to maintain its availability in memory.
- ❑ **Elaborative Rehearsal:** Association of new information with already stored knowledge and analysis of the new information to make it memorable.



rehearsal

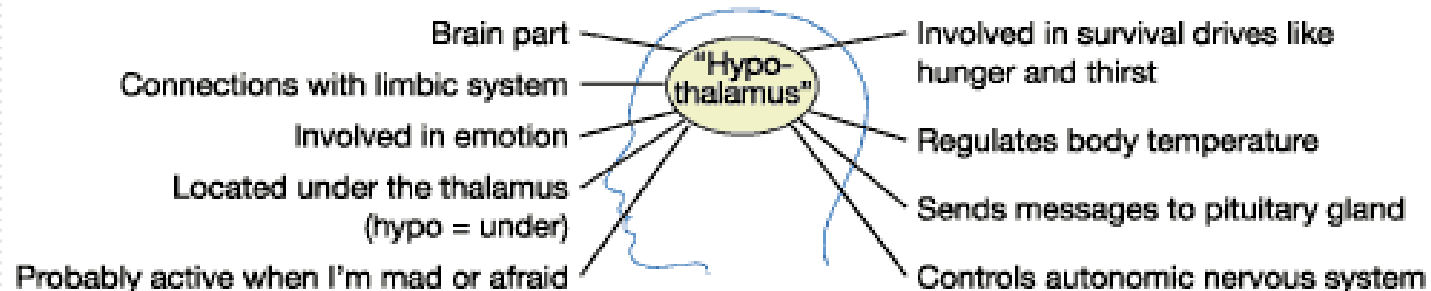
IMPOVERISHED ENCODING

(poor retention)



ELABORATE ENCODING

(good retention)



Memory techniques- mnemonics

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

Theories of forgetting

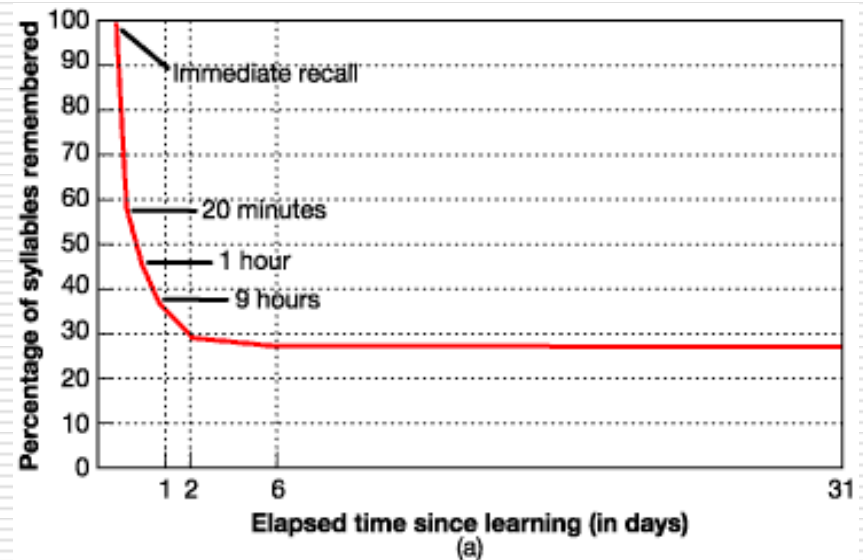
- Decay
 - Interference
 - Cue-dependent forgetting
-

Decay

- **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)
-

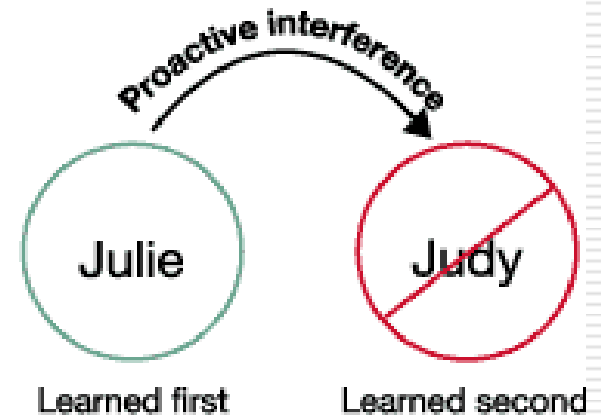
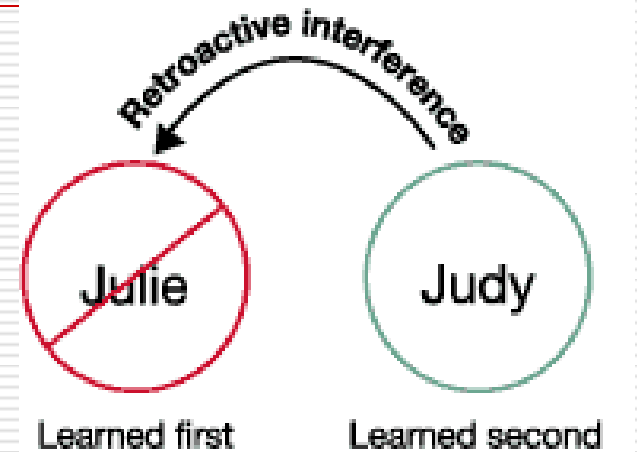
Forgetting Curve

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



Interference

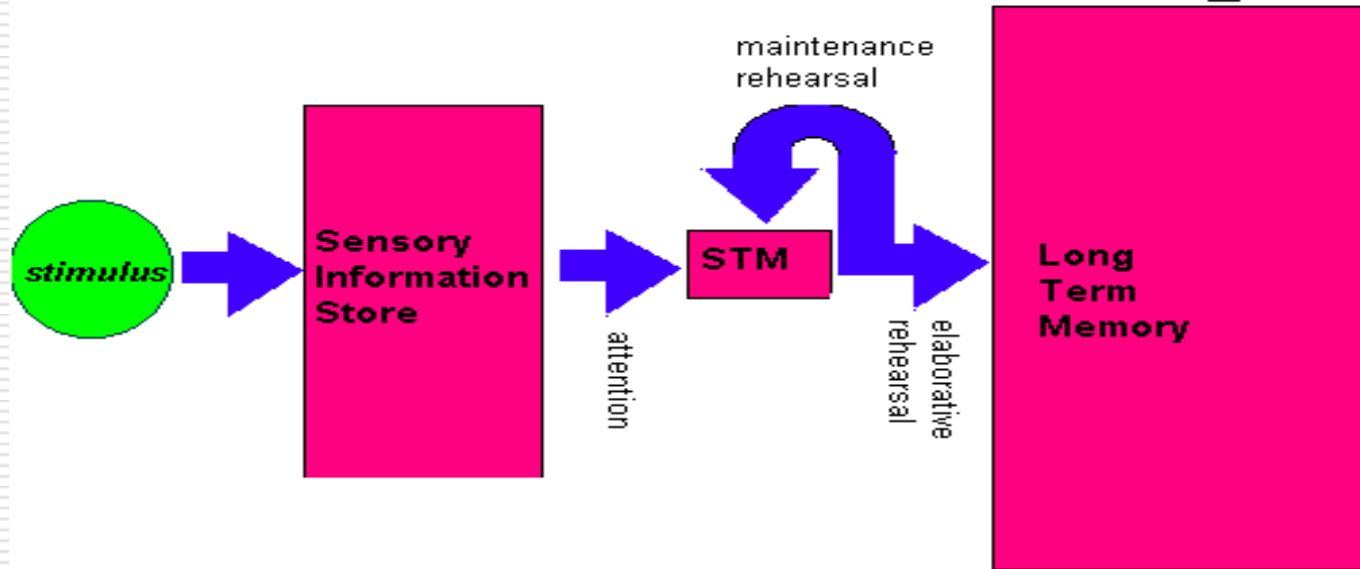
- ❑ **Retroactive Interference:** Forgetting that occurs when recently learned material interferes with the ability to remember similar material stored previously.
- ❑ **Proactive Interference:** Forgetting that occurs when previously stored material interferes with the ability to remember similar, more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



Cue-dependent Forgetting

- ❑ **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.
-

Atkinson and Shiffrin



Sensory memory

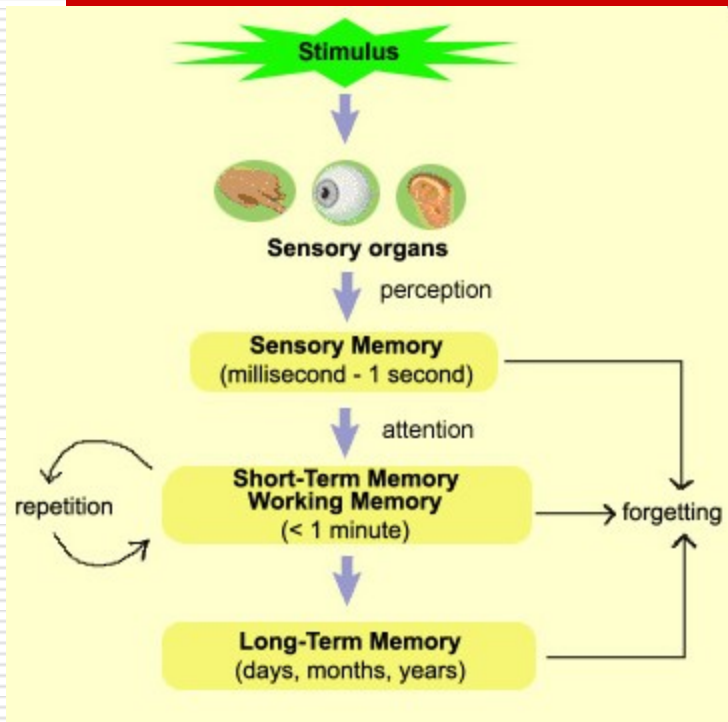
- ❑ Great capacity
 - ❑ Time limitation
 - ❑ 2 sec
 - ❑ Attention necessary for further processing
 - ❑ Fast decay of information
-

Sensory memory (iconic memory)

- Research of George Sperling
- Latency : 50ms

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

Transfer of info from SM to STM



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

Selectivity of attention

http://www.youtube.com/watch?v=IGQmdoK_ZfY

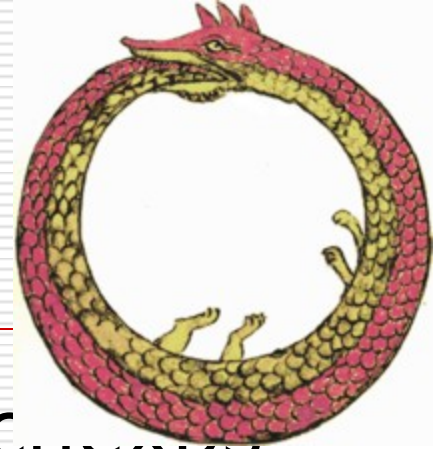
Short-term memory

- ❑ 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.”

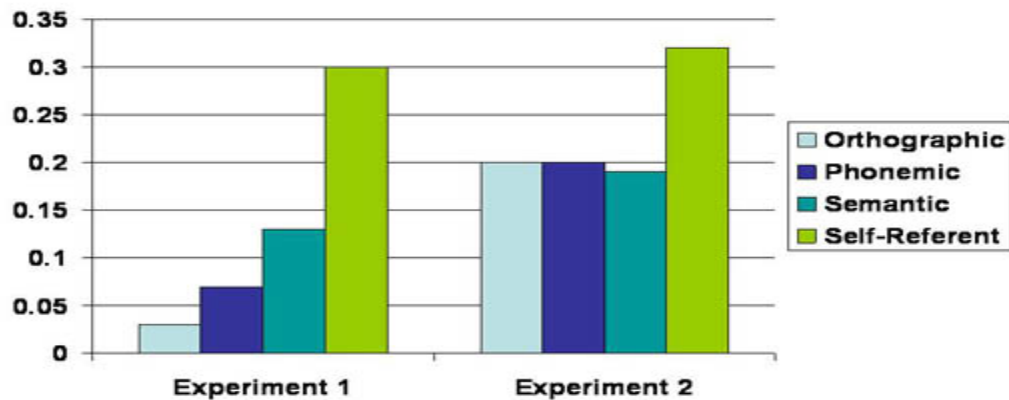


Self-reference effect

- http://www.psych.uni.edu/psych/exps/exps/Self_Reference/selfref99.htm

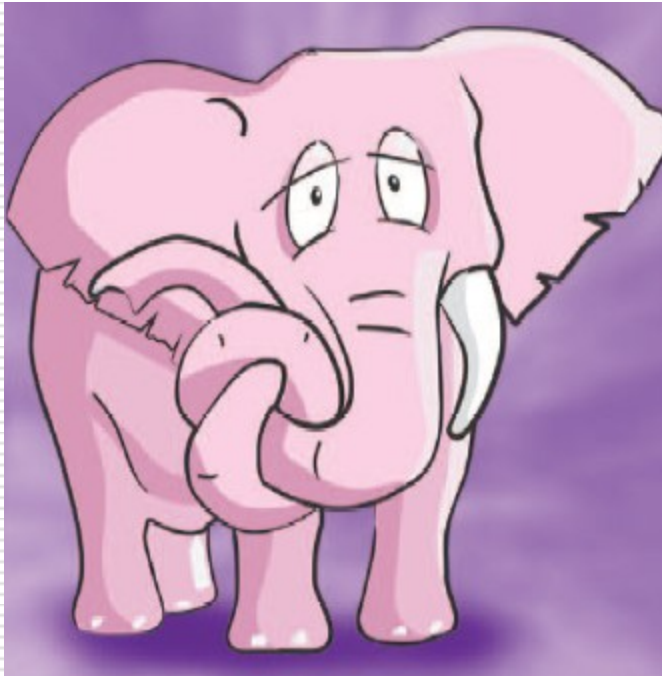
The Self-Reference Effect

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



Long-term memory

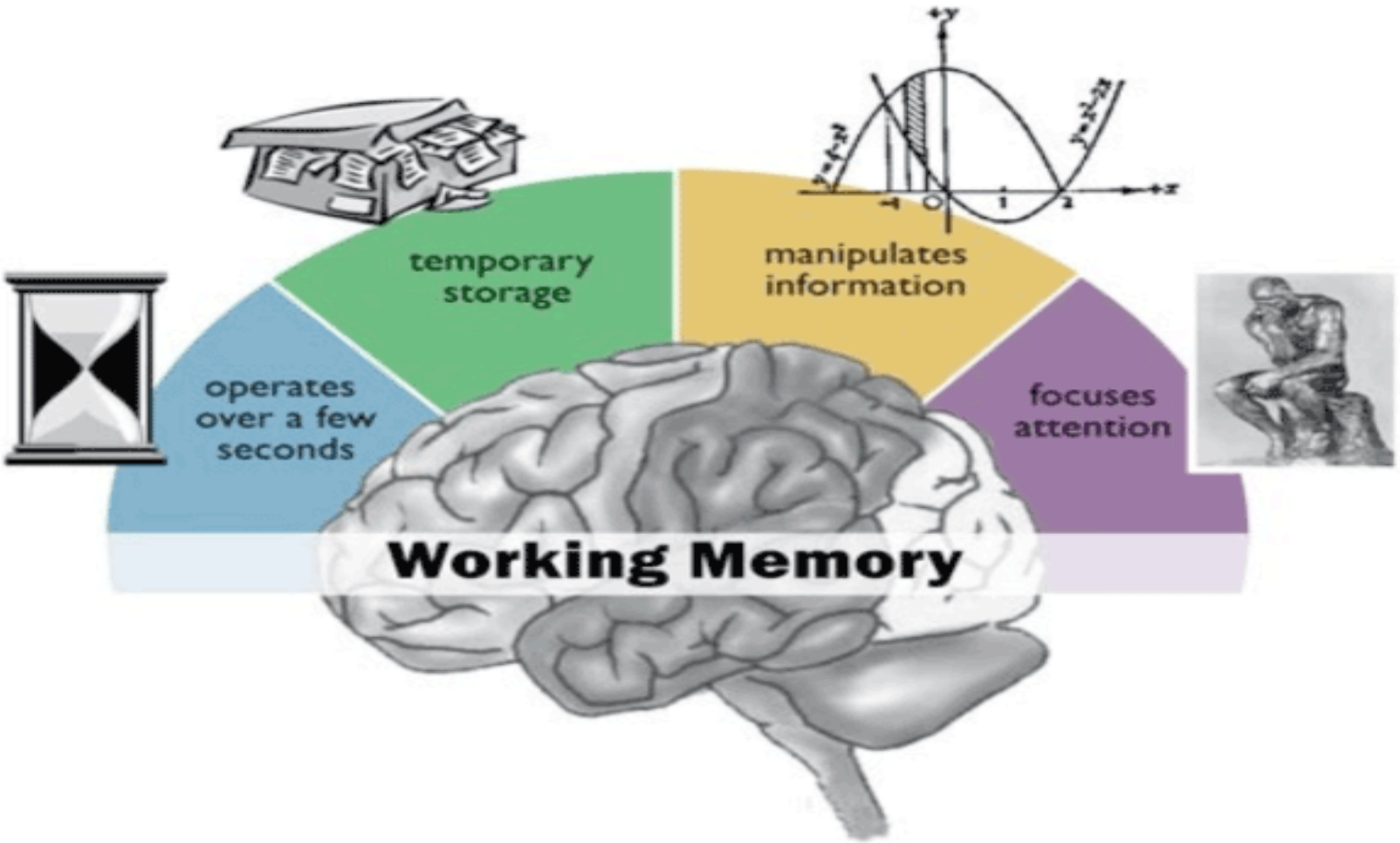
- “relatively” unlimited (time and space-wise)



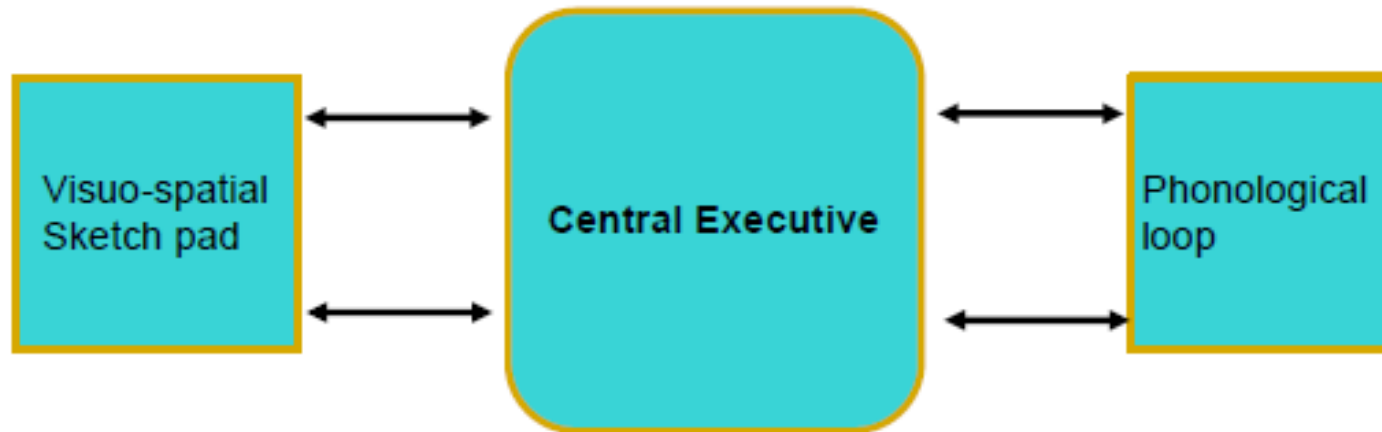
Long-term memory loss

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

Baddeley- working memory



Working memory: Alan Baddeley



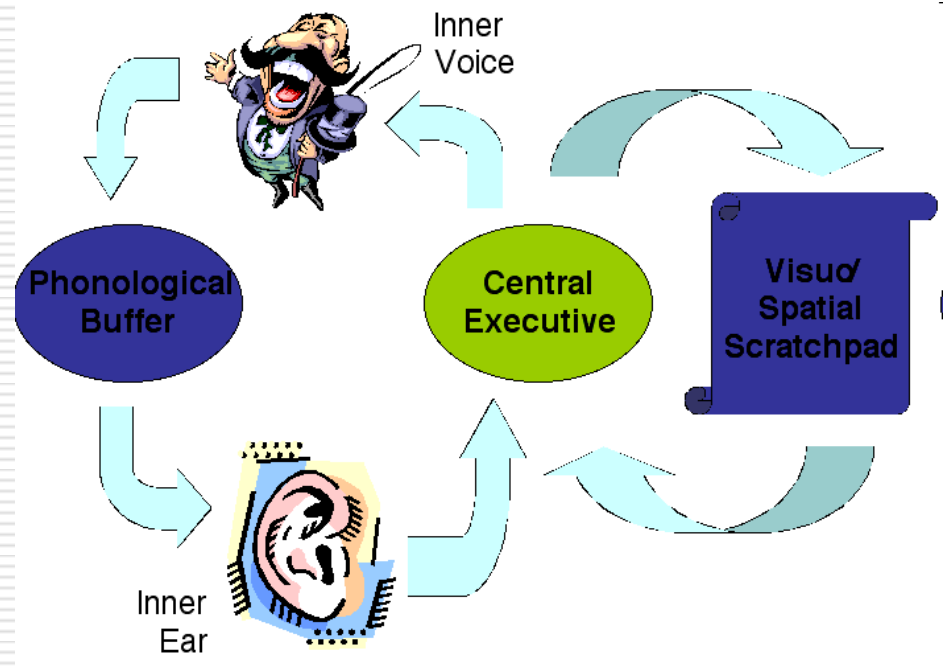
- These three components are all assumed to have limited capacity.
- They are also assumed to be mostly independent of each other.
- This predicts that:
 - if two tasks require use of the component, then they cannot be successfully completed at the same time.
 - if two tasks require different components,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

Baddeley- working memory

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

Central Executive/ „supervisor“

- 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*

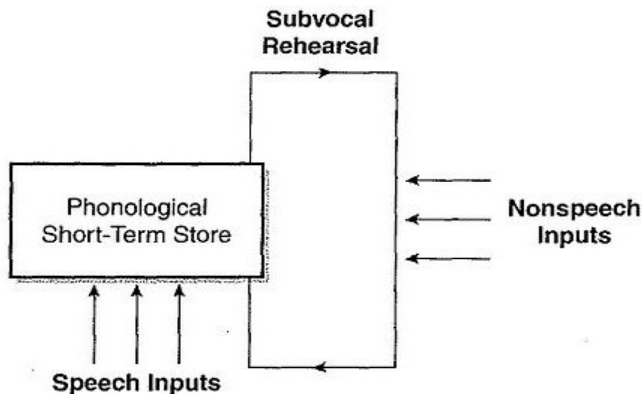


FIGURE 5.2 The Phonological Loop, with the Phonological Store and the Articulatory Loop

Source: Baddeley, 1986

Phonological Loop

- 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.....

Phonological Loop

- 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
-

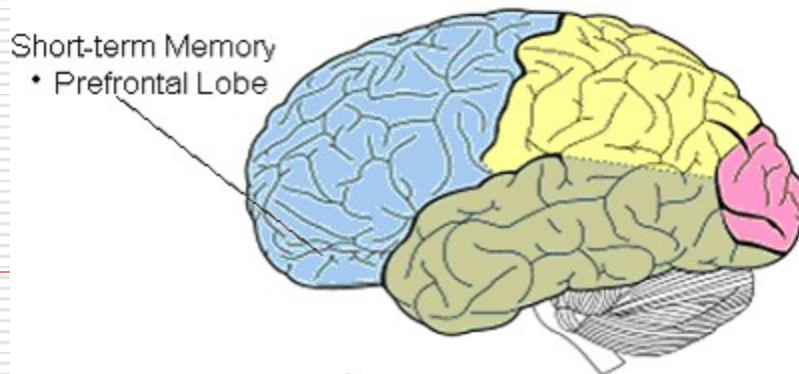
Visuospatial sketchpad

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

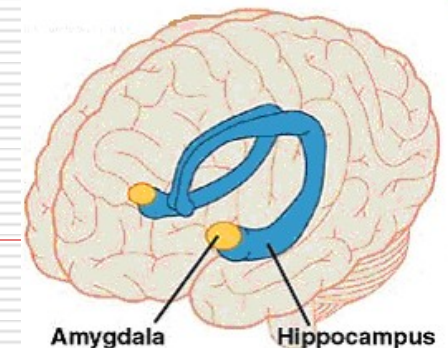
STM/WM vs LTM

- 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)**

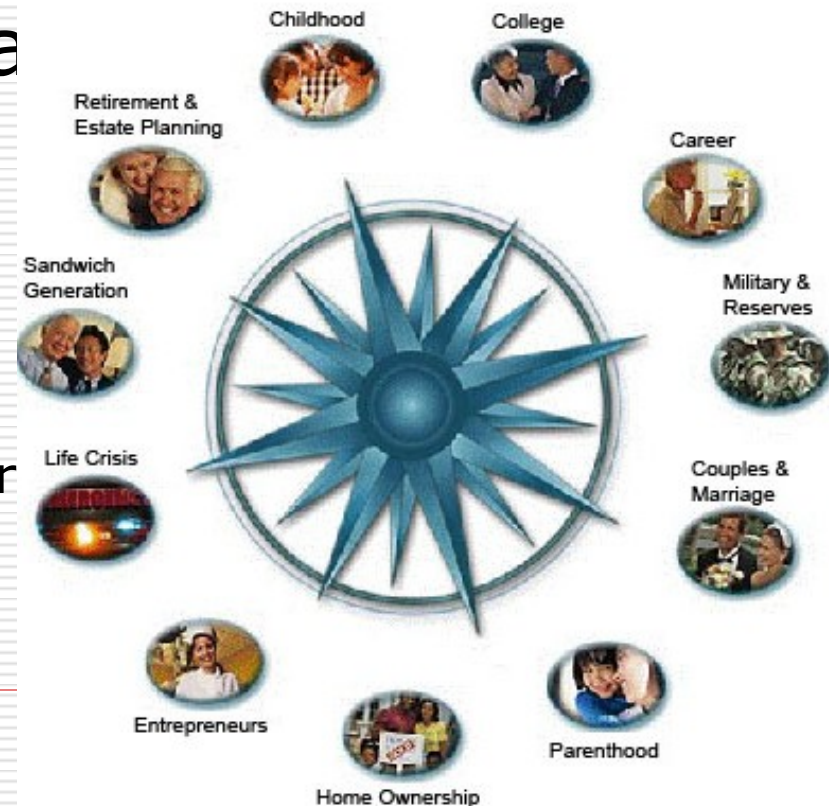


Autobiographical Memory

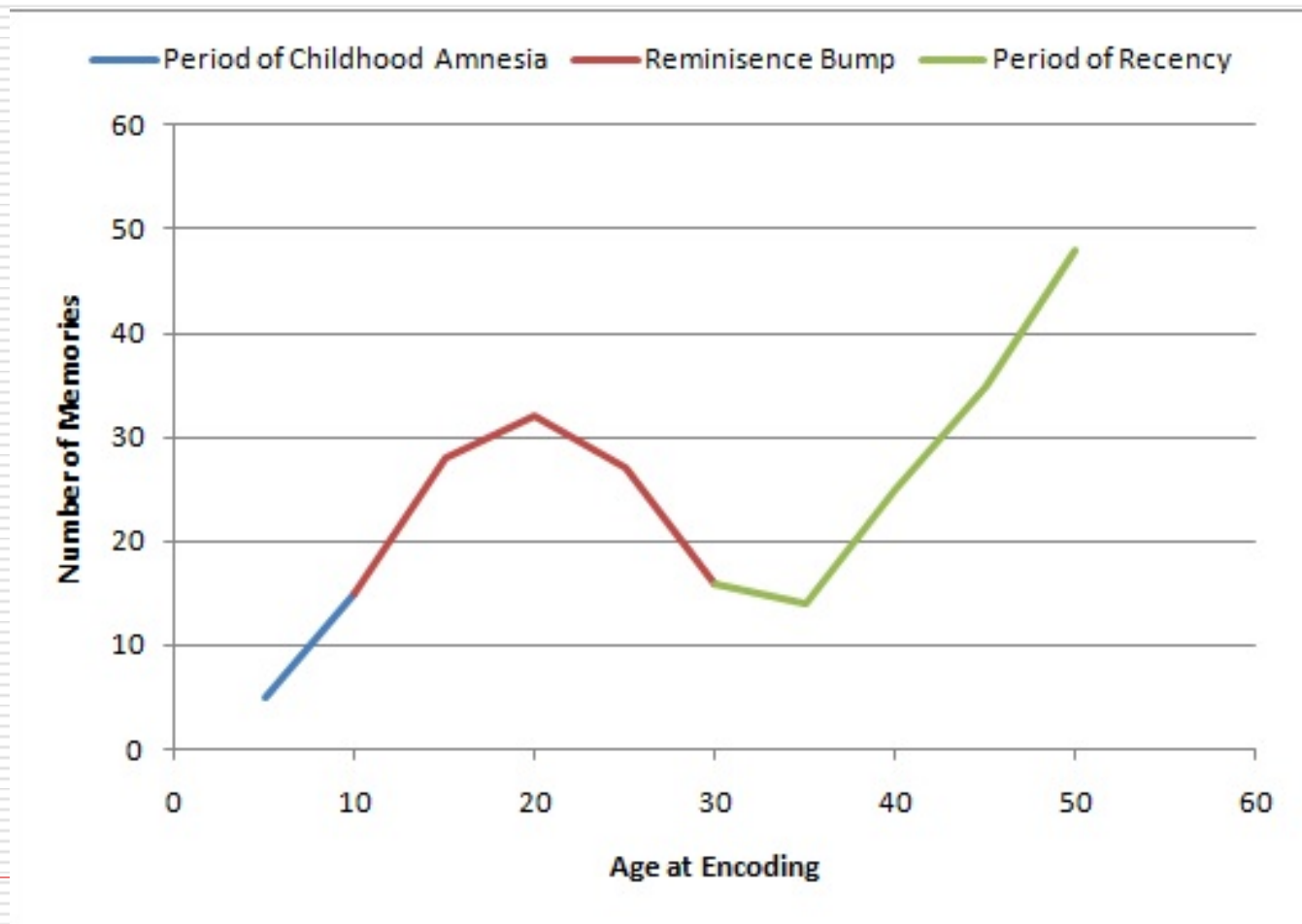
- **The reminiscence bump:** people recall a disproportionately large number of autobiographical memories of events that happened when they were about 15-25 years of age

- **WHY?**

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



Autobiographical Memory



Autobiographical Memory

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

