



Chapter 7

The Nature of Memory

PSY 100

Rick Grieve, Ph.D.

Western Kentucky University

What is Memory?

- Memory
 - The retention of information over time



What is Memory?

- Encoding
 - How information gets into memory
- Storage
 - The retention of information over time
- Retrieval
 - Bringing information out of memory storage

Memory Encoding

- Rehearsal
 - The conscious repetition of information that increases the length of time that information stays in memory
- Depth of processing
 - Deep processing of stimuli produces better memory of them
- Elaboration
 - The extensiveness of processing at any given depth of memory

Organization: Chunking

In the following screen, you will see a series of letters. Try to remember as many letters as you can:

Organization: Chunking

O LDH ARO LDAN DYU UNGB EN

Organization: Chunking

How many could you recall?

In the following screen, you will see another series of letters. Try to remember as many letters as you can:



Organization: Chunking

OLD HAROLD AND YOUNG BEN

Organization: Chunking

How many could you recall?

Organizing information into higher-order units is called chunking.

Memory Storage

- Atkinson-Shiffrin theory
 - Memory involves a sequence of three stages
 - Sensory memory
 - Short-term (working) memory
 - Long-term memory

Sensory Memory

- Sensory memory
 - A form of memory storage that hold information from the world in its original sensory form for only an instant, not much longer than the brief time it is exposed to the visual, auditory, and other senses

Sensory Memory

- Echoic memory
 - Auditory sensory memory in which information is retained for up to several seconds
- Iconic memory
 - Visual sensory memory in which information is retained for only about 1/4 second

Sensory Memory

In the following screen, you will see a series of letters for less than a second. Try to remember as many letters as you can:

Sensory Memory

L	H	V
R	F	Z
D	T	C

Sensory Memory

**How many letters were there?
Name them.**

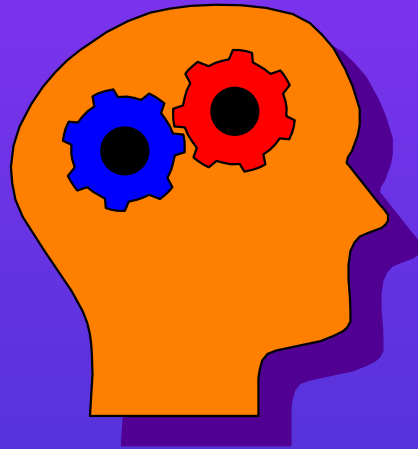
**Why do you know how many there were,
but can't name them all?**

Working (Short-Term) Memory

- Working memory
 - A limited-capacity storage system in which information is retained for as long as 30 seconds, unless it is rehearsed, in which case it can be retained longer
- Memory span
 - The number of digits an individual can report back in order after a single presentation of them

Long Term Memory

- Long-term memory
 - A relatively permanent type of memory that holds huge amounts of information for a long period of time



Memory's Contents

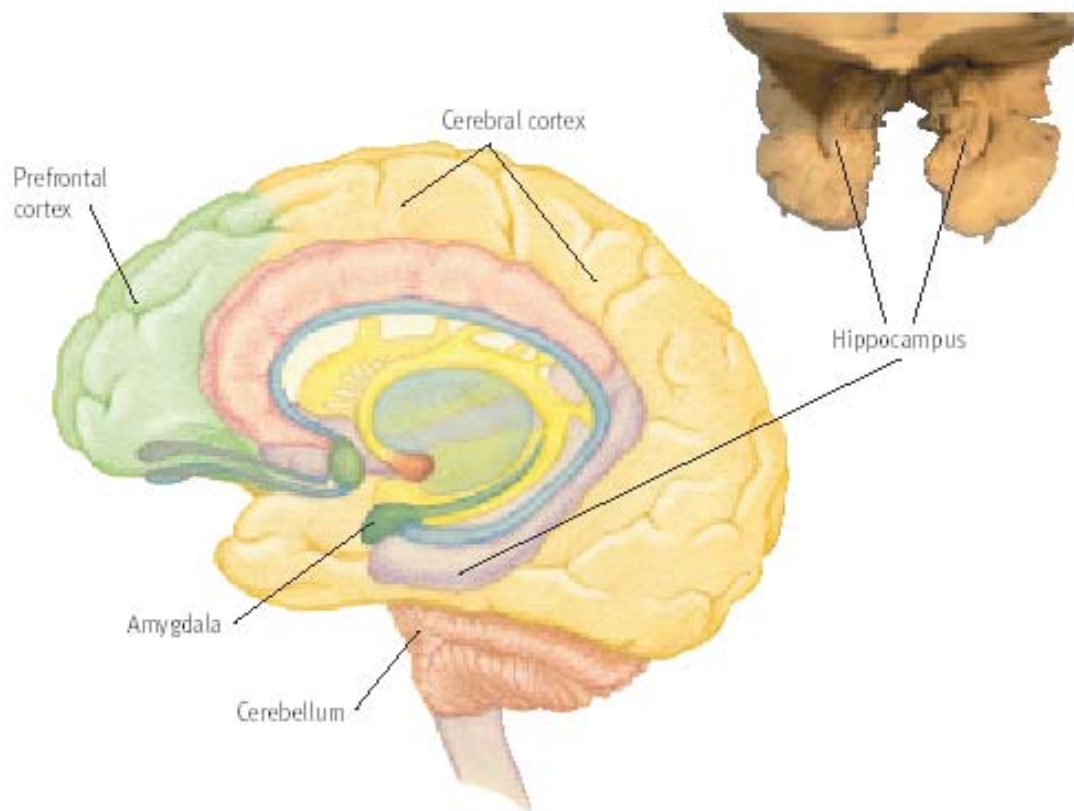
- Declarative memory
 - The conscious recollection of information, such as specific facts or events
 - Can be verbally communicated
- Nondeclarative memory
 - Memory that is affected by prior experience without that experience being consciously recollected
 - Cannot be verbally communicated

Declarative Memory

- Episodic memory
 - The retention of information about the where and when of life's happenings
- Semantic memory
 - A person's knowledge about the world
 - General academic knowledge, meanings of words, important places/dates, etc.

Representing Memory

- Network theories
 - Our memories can be envisioned as a complex network of nodes that stand for labels or concepts
- Schema theories
 - When we reconstruct information, we use existing concepts (schemas) to organize and interpret information



Wadsworth collection

Figure 7.25

The anatomy of memory.

All the brain structures identified here have been implicated in efforts to discover the anatomical structures involved in memory. Although its exact contribution to memory remains the subject of debate, the hippocampus is thought to play an especially central role in memory.

Memory Retrieval

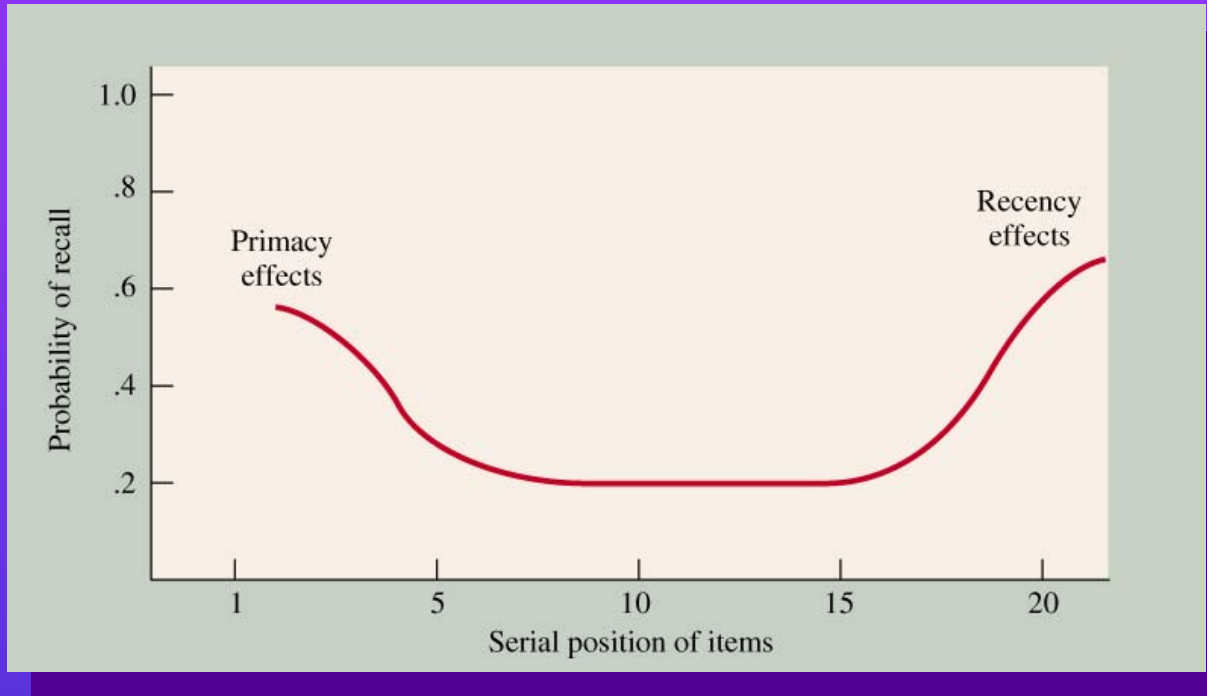
- Tip-of-the-tongue phenomenon
 - A type of “effortful retrieval” that occurs when people are confident they know something but just can’t quite seem to pull it out of memory



Memory Retrieval

- Serial position effect
 - Recall is superior for the items at the beginning of a list and the end of a list
- Primacy effect
 - Superior recall for items at the beginning of a list
- Recency effect
 - Superior recall for items at the end of a list

Serial Position Effect



Retrieval Cues

■ Recall

- A memory measure in which the individual must retrieve previously learned information
- Essay test

■ Recognition

- A memory measure in which the individual only has to identify (“recognize”) learned items
- Multiple choice test

Retrieval Cues

- Encoding specificity principle
 - Associations formed at the time of encoding or learning tend to be effective retrieval cues
- Priming
 - Activating particular connections or association in memory

Emotional Memories

- Flashbulb memories



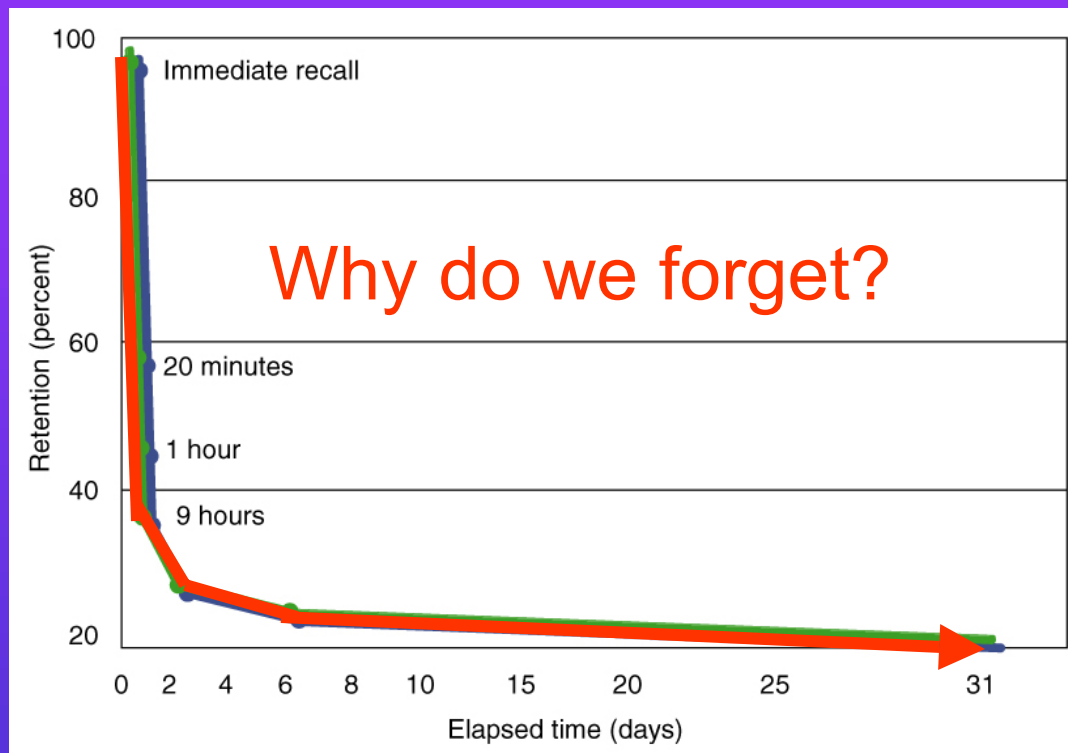
- Memories of emotionally significant events that people often recall with more accuracy and vivid imagery than everyday events

- Personal trauma

- Repressed memories

- Mood-congruent memories

Forgetting



Forgetting

- Interference theory
 - We forget because other information gets in the way of what we want to remember
- Proactive interference
 - Material that was learned earlier disrupts the recall of material learned later
- Retroactive interference
 - Material learned later disrupts retrieval of information learned earlier

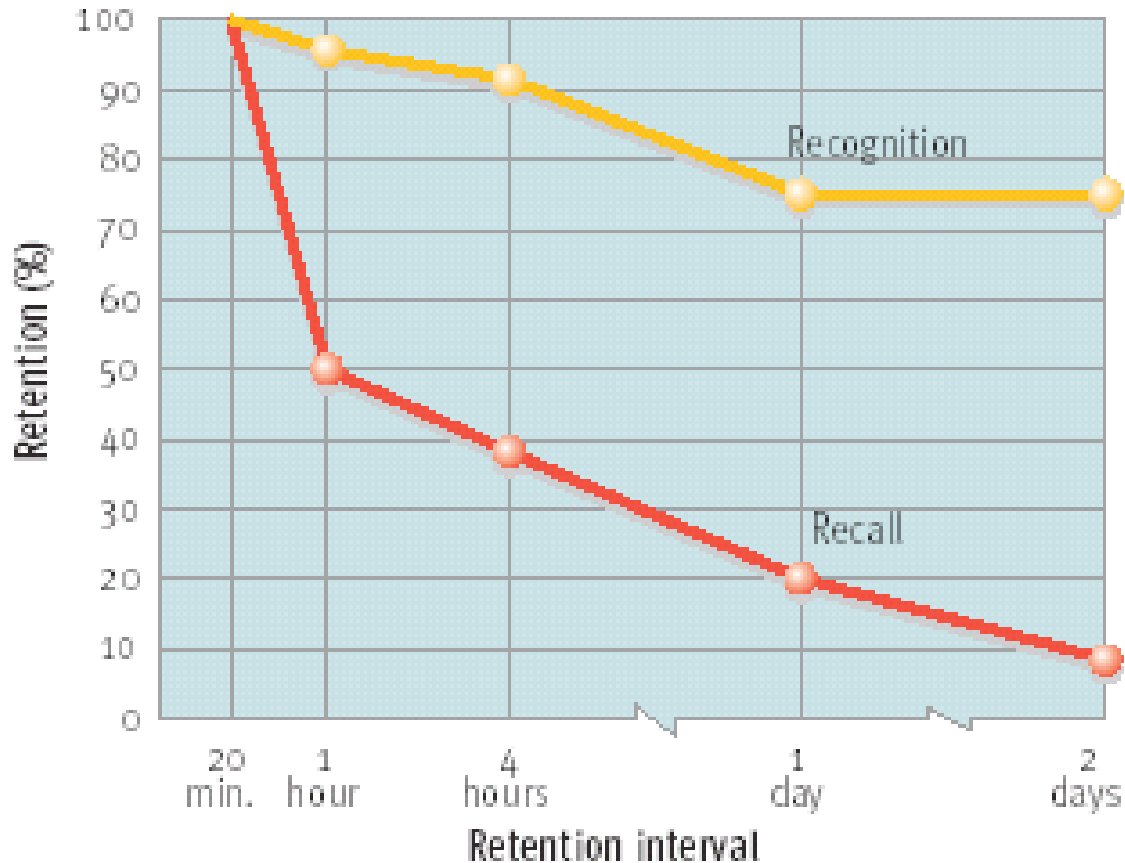
Amnesia

- Anterograde amnesia
 - Affects the retention of new information or events
 - Doesn't affect information learned before the onset of the condition
- Retrograde amnesia
 - Memory loss for a segment of the past but not for new events

Figure 7.19

Recognition versus recall in the measurement of retention.

Luh (1922) had participants memorize lists of nonsense syllables and then measured their retention with either a recognition test or a recall test at various intervals up to two days. As you can see, the forgetting curve for the recall test was quite steep, whereas the recognition test yielded much higher estimates of subjects' retention. (Data from Luh, 1922).



Memory and Study Strategies

- Effective strategies
 - Pay attention and minimize distraction
 - Understand the material rather than rote memorize it
 - Organize what you put into memory



Improving Everyday Memory

- Engage in adequate rehearsal
- Distribute practice and minimize interference
- Emphasize deep processing and transfer-appropriate processing
- Organize information
- Use acronyms
- Use verbal mnemonics
- Use visual mnemonics

Effective Strategies

- Ask yourself questions
- Spread out and consolidate your learning
- Cognitively monitor your progress
- Be a good time manager and planner