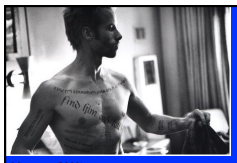


Memento (2000)

Memory

Chapter 8
Fall 2010
Psy 12000.003

Guest Lecture: Megan McCarty

1

The Phenomenon of Memory

Memory is *any indication* that learning has persisted over time. It is our ability to store and retrieve information.

What are typical indications?

2

Memorizing Pi

- http://www.yourdailymedia.com/media/1162388377/Pi_Freak
- OR http://www.ebaumsworld.com/video/watch/1016143/

3

Memory

Memory is the basis for knowing your friends, your neighbors, the English language, the national anthem, and yourself.

If memory was nonexistent, everyone would be a stranger to you; every language foreign; every task new; and even you yourself would be a stranger.

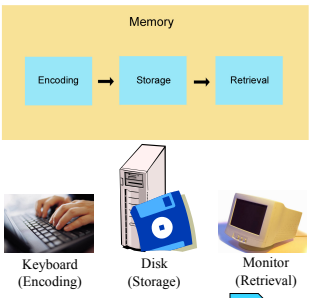
4

What Would Life Be Like Without Memory?

The case of Clive Wearing, Pts. I & II

http://www.youtube.com/watch?v=wDNDRDJy-vo

Stages of Memory



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Information Processing

The Atkinson-Schiffrin (1968) three-stage model of memory includes:

a) sensory memory

b) short-term memory

c) long-term memory

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Problems with the Model

- Some information skips the first two stages and enters long-term memory automatically.
- Because we cannot focus all the sensory information in the environment, we select information (through attention) that is important to us.
- The nature of short-term memory is more complex.

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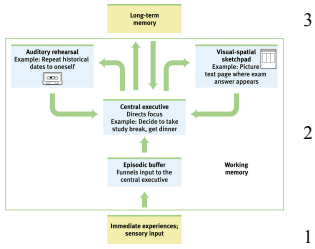
Working Memory

Alan Baddeley (2002) proposes that working memory contains auditory and visual processing controlled by the central executive through an episodic buffer.



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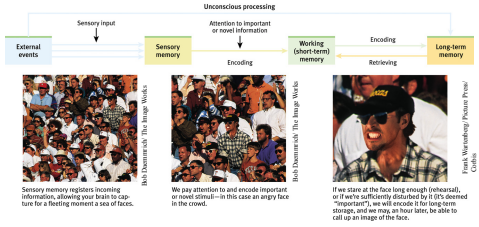
Working Memory Example



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Encoding: Getting Information In

How We Encode

- Some information (where the dairy section is in the grocery store) is *automatically* processed.
- However, new or unusual information (friend's new cell-phone number) requires attention and effort.

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Automatic Processing

We process an enormous amount of information effortlessly, such as the following:

- Space: While reading a textbook, you automatically encode the place of a picture on a page.
- Time: We unintentionally note the events that take place in a day.
- Frequency: You effortlessly keep track of things that happen to you.

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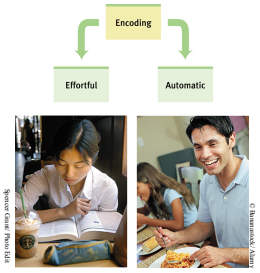
Effortful Processing

Committing novel information to memory requires effort just like learning a concept from a textbook. Such processing leads to durable and accessible memories.



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Rehearsal

Effortful learning usually requires rehearsal or conscious repetition.

Ebbinghaus studied rehearsal by using nonsense syllables: TUV YOF GEK XOZ

Hermann Ebbinghaus (1850-1909)

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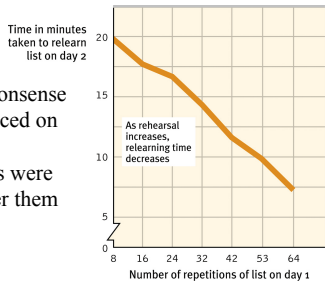
Rehearsal

The more times the nonsense syllables were practiced on Day 1, the fewer repetitions were required to remember them on Day 2.



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Memory Effects

- Next-in-line-Effect:
  - When you are so anxious about being next that you cannot remember what the person just before you in line says, but you can recall what other people well before or after you say.

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Spacing Effect

Distributing rehearsal (spacing effect) is better than practicing all at once (*massed practice*). Robert Frost's poem could be memorized with fair ease if spread over time.

ACQUAINTED WITH THE NIGHT
Robert Frost

I have been one acquainted with the night.
I have walked out in rain — and back in rain.
I have outwalked the furthest city light.
… …

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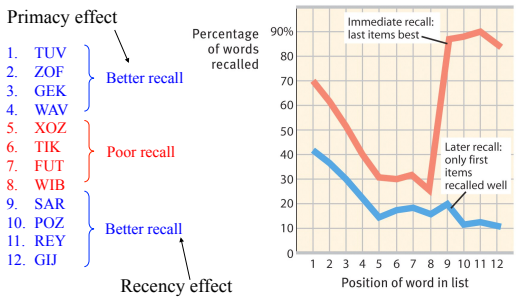
Serial Position Effect



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Mnemonics

Imagery is at the heart of many memory aids. Mnemonic techniques use vivid imagery in aiding memory.

1. Method of Loci
2. Link Method

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Method of Loci

List of Items	**Imagined Locations**
Charcoal	Backyard
Pens	Study
Bed Sheets	Bedroom
Hammer	Garage
.	.
.	.
.	.
Rug	Living Room

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Link Method

List of Items
Newspaper
Shaving cream
Pen
Umbrella
.
.
.
Lamp

http://www.youtube.com/watch?v=9NROegsMqNc

Involves forming a mental image of items to be remembered in a way that links them together.

21

Organizing Information for Encoding

Break down complex information into broad concepts and further subdivide them into categories and subcategories.

1. Chunking
2. Hierarchy

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Chunking

Organizing items into a familiar, manageable unit. Try to remember the numbers below.

1-7-7-6-1-4-9-2-1-8-1-2-1-9-4-1

If you are well versed with American history, chunk the numbers together and see if you can recall them better. 1776 1492 1812 1941.

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Chunking

Acronyms are another way of chunking information to remember it (these are also mnemonics).

HOMES = Huron, Ontario, Michigan, Erie, Superior

PEMDAS = Parentheses, Exponent, Multiply, Divide, Add, Subtract

ROY G. BIV = Red, Orange, Yellow, Green, Blue, Indigo, Violet

OCEAN = Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism (also CANOE)

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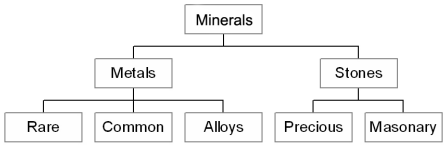
Hierarchy

Complex information broken down into broad concepts and further subdivided into categories and subcategories.



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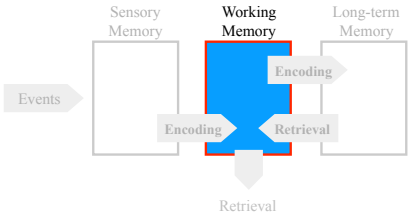
Working Memory



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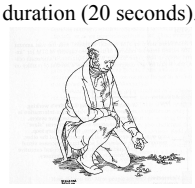
Working Memory

Working memory, the new name for short-term memory, has a limited capacity (7±2) and a short duration (20 seconds).



Sir George Hamilton observed that he could accurately remember up to 7 beans thrown on the floor. If there were more beans, he guessed.

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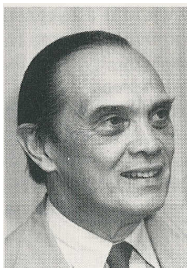
Capacity

The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information (1956).



George Miller

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Chunking

The capacity of the working memory may be increased by "Chunking."

F-B-I-T-W-A-C-I-A-I-B-M

FBI TWA CIA IBM

4 chunks

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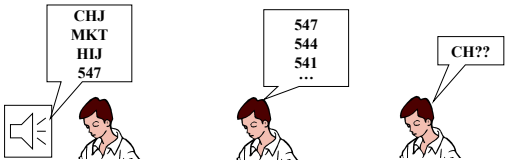
Duration

Brown/Peterson and Peterson (1958/1959) measured the duration of working memory by manipulating rehearsal.



The duration of the working memory is about 20 sec.

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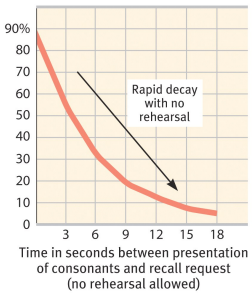
Working Memory Duration

Also called, "the forgetting curve"



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Shallow vs. Deep Processing

- Deeply processed information is better remembered than shallowly processed information
- Shallow instructions:
  - look at word list and determine if each word has a capital letter in it or not
  - Is the word a verb or noun?
  - What rhymes with each word?
- Deep instructions:
  - What is the meaning of each word? Does each word have more than one meaning?
  - Relate each word to yourself

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Measures of Memory

In recognition, the person must identify an item amongst other choices. (A multiple-choice test requires recognition.)

1. Name the capital of France.

   a. Brussels
   b. Rome
   c. London
   d. Paris

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Measures of Memory

In recall, the person must retrieve information using effort. (A fill-in-the blank test requires recall.)

1. The capital of France is _____.

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Measures of Memory

In relearning, the individual shows how much time (or effort) is saved when learning material for the second time.

List
Jet
Dagger
Tree
Kite
…
Silk
Frog
Ring

It took 10 trials to learn this list

1 day later

List
Jet
Dagger
Tree
Kite
…
Silk
Frog
Ring

It took 5 trials to learn the list

$$\text{Saving} = \frac{\text{Original Trials} - \text{Relearning Trials}}{\text{Relearning Trials}} \times 100$$

$$= \frac{10 - 5}{10} \times 100$$

$$= 50\%$$

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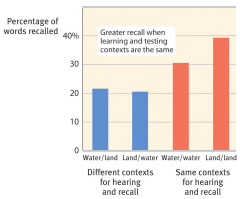
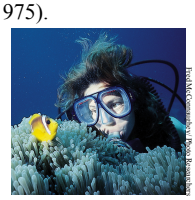
Context Effects

Scuba divers recall more words underwater if they learned the list underwater, while they recall more words on land if they learned that list on land (Godden & Baddeley, 1975).





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Moods and Memories

We usually recall experiences that are consistent with our current mood. Emotions, or moods, serve as retrieval cues.

Keyser Schreier, Still Pictures

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Flashbulb Memory

A unique and highly emotional moment may give rise to a clear, strong, and persistent memory called flashbulb memory. However, this memory is not free from errors.

Reuters/ Corbis

President Bush being told of 9/11 attack.

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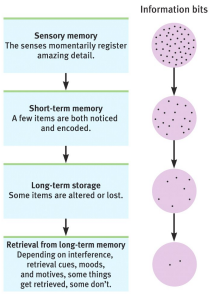
Why do we forget?

Forgetting can occur at any memory stage. We filter, alter, or lose much information during these stages.



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Improving Memory

1. Study repeatedly to boost long-term recall.
2. Spend more time rehearsing or actively thinking about the material.
3. Make material personally meaningful.
4. Use mnemonic devices:
   - associate with peg words — something already stored
   - make up a story
   - chunk — acronyms

40

Improving Memory

5. Activate retrieval cues — mentally recreate the situation and mood.
6. Recall events while they are fresh — before you encounter misinformation.
7. Minimize interference:
   1. Test your own knowledge.
   2. Rehearse and then determine what you do not yet know.

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